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North Carolina Department of Transportation
Statewide Planning Branch
Systems Planning Unit

Town of Winterville Thoroughfare Plan




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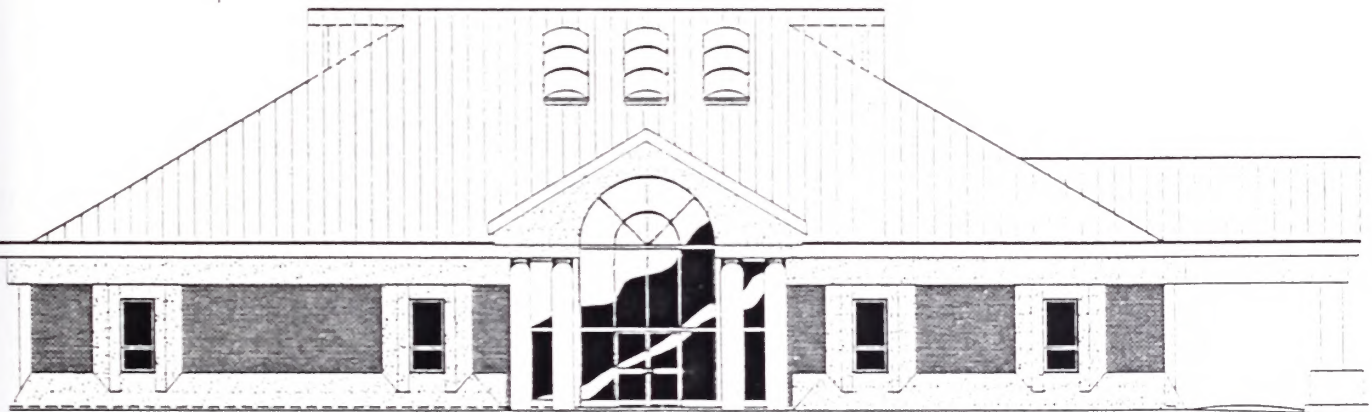
**THOROUGHFARE PLAN
FOR THE
TOWN OF WINTERVILLE, NORTH CAROLINA**

Prepared by the:

Statewide Planning Branch
Division of Highways
N. C. Department of Transportation

In cooperation with:

The Town of Winterville
The Federal Highway Administration
U. S. Department of Transportation



Future Winterville Town Hall

July, 1992

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100 copies of this document were printed at a cost
of \$190.83, or \$1.90 per copy. (G.S. 143-170.1)

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1. INTRODUCTION

Transportation has played an integral role in the development of Winterville. As a rapidly growing suburb of Greenville (see Figure 1), travel between the two areas has become more extensive. The need for improved transportation facilities has grown accordingly. This report identifies the recommended street and highway improvements that are necessary in the Winterville area to meet transportation needs during the planning period from 1990-2015.

There are many benefits to be derived from thoroughfare planning. The primary objective is to enable the urban street system to be progressively developed to serve future traffic demands in the Winterville area. In addition, the system of thoroughfares should be developed based on the principles of thoroughfare planning as discussed in Chapter II.

A preliminary thoroughfare plan for the Town of Winterville was developed in 1970. This plan was a cooperative effort between the Town, the Community Planning Division of the North Carolina Department of Public Affairs, and the Planning and Research Department of the North Carolina State Highway Commission. It was adopted by the Town of Winterville on June 15, 1970, and by the State Highway Commission on August 6, 1970.

On November 15, 1989, the Town of Winterville formally requested an update of their thoroughfare plan. Due to the growth in the region, the planning boundaries were expanded to include additional areas to the east, west, and south of the corporate limits of Winterville. Because of this expansion, Winterville now shares planning boundaries with two other municipalities. The northern planning boundary coincides with Greenville's southern planning boundary and is located along Fire Tower Road and Davenport Farm Road. An update of Greenville's thoroughfare plan was completed in mid-1990. The southern planning boundary is shared with the Town of Ayden and is located just south of Reedy Branch Road. An update of Ayden's thoroughfare plan is being studied concurrently with Winterville's plan. Every effort was made to provide the most efficient interconnected network of roadways between these three municipalities.

The purpose of this report is to document the 1990-1992 study findings and recommendations. Included are recommendations for thoroughfare cross sections, cost estimates for recommended improvements, an evaluation of benefits to be gained from improvements, and recommendations for plan implementation. It should be emphasized that the recommended plan is based on the anticipated growth of the area as indicated by current trends. Prior to the construction of specific projects, a more detailed study will be required to assess the differences between the projected and actual conditions in Winterville and to determine the specific locations and design requirements for each project.

Some of the improvements proposed in this report will be the responsibility of the North Carolina Department of Transportation while others will be the responsibility of the Town. For optimum benefit, improvements made by the State need to be closely coordinated with those made by the Town. To ensure coordination, the plan was formally adopted as an official guide for the development of the future transportation system. The next step is to execute a system responsibility agreement designating which thoroughfares will be the responsibility of the State and which will be the responsibility of the Town.

GEOGRAPHIC LOCATION

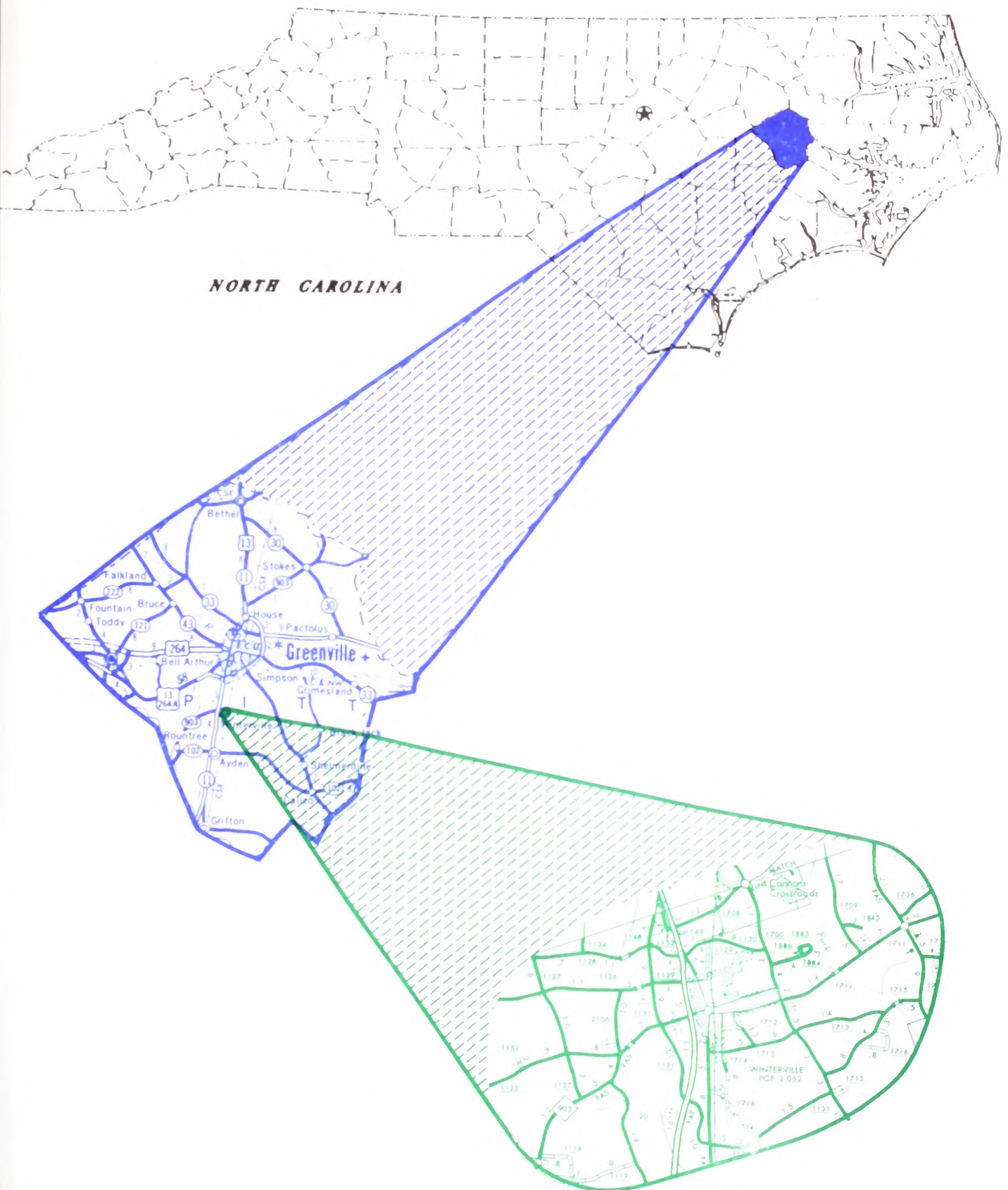


FIGURE 1

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2. THOROUGHFARE PLANNING PRINCIPLES

Objectives

Typically, the urban street system occupies 25 to 30 percent of the total developed land in an urban area. Since the system is permanent and expensive to build and maintain, much care and foresight are needed in its development. Thoroughfare planning is the process public officials use to assure the development of the most appropriate street system to meet existing and future travel desires within the urban area.

The primary aim of a thoroughfare plan is to guide the development of the urban street system in a manner consistent with the changing traffic patterns. A thoroughfare plan will enable street improvements to be made as traffic demands increase. It will also help eliminate unnecessary improvements, so that needless expense can be averted. By developing the urban street system to keep pace with increasing traffic demands, a maximum utilization of the system can be attained, requiring a minimum amount of land for street purposes. In addition to providing for traffic needs, the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future residential, commercial, and industrial development affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

- (1) providing for the orderly development of an adequate major street system as land development occurs;
- (2) reducing travel and transportation costs;
- (3) reducing the cost of major street improvements to the public through the coordination of the street system with private action;
- (4) enabling private interests to plan their actions, improvements, and development with full knowledge of public intent;
- (5) minimizing the disruption and displacement of people and businesses through long-range advance planning for major street improvements;
- (6) reducing environmental impacts, such as air pollution, resulting from transportation; and
- (7) increasing travel safety.

Thoroughfare planning objectives are achieved by improving both the operational efficiency of thoroughfares and the system efficiency through system coordination and layout.

Operational Efficiency

A street's operational efficiency is improved by increasing the capability of the street to carry more vehicular traffic and people. A street's capacity is defined by the maximum number of vehicles which can pass a given point on a roadway during a given time period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, nature of traffic, and weather.

Physical ways to improve vehicular capacity include street widening, intersection improvements, improvements to the vertical and horizontal alignment, and the elimination of roadside obstacles. For example, widening a street from two to four lanes more than doubles the capacity of the street by providing additional maneuverability for traffic. This reduces the impedances to traffic flow caused by slow moving or turning vehicles and the adverse effects of horizontal and vertical alignments.

Methods for improving the operational efficiency of a street, thus increasing its capacity, include:

- (1) **Control of access** -- A roadway with complete access control can often carry three times the traffic handled by a uncontrolled access street with identical lane width and number.
- (2) **Parking removal** -- An increase in capacity can be realized by removing on-street parking. This provides additional street width for traffic flow and reduces the friction to traffic flow caused by parking vehicles.
- (3) **One-way operation** -- The capacity of a street can sometimes be increased 20-50%, depending upon turning movements and overall street width, by initiating one-way traffic operations. One-way streets can also improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.
- (4) **Reversible lanes** -- Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.
- (5) **Signal phasing and coordination** -- Coordinated signals and proper signal phasing allow for smoother traffic flow and reduce excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

- (1) encouraging people to form car pools and van pools for journeys to work and other trip purposes -- this reduces the number of vehicles on the roadway and raises the people-carrying capability of the street system;
- (2) encouraging the use of transit and bicycle modes;
- (3) encouraging industries, businesses, and institutions to stagger work hours or establish variable work hours for employees -- this will spread peak travel over a longer time period and thus reduce peak hour demand;
- (4) planning and encouraging land use development or redevelopment in a more travel efficient manner;
- (5) and developing a more efficient system of streets to better serve the travel desires of the public. The development of an improved street system is one of the primary objectives of the thoroughfare plan and will be discussed below in more detail.

System Efficiency

An efficient transportation system can minimize travel distances, time, and cost to the user. Improvements in system efficiency can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

Functional Classification

Streets perform two primary functions -- traffic service and land service -- which, when combined, are basically incompatible. This conflict is not serious if both traffic and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely used abutting property lead to intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets which permits travel from origins to destinations with directness, ease, and safety. Different streets in the system are designed and called on to perform specific functions, thus minimizing the traffic and land service conflict. Streets are categorized by function as local access streets, minor thoroughfares, or major thoroughfares.

Local Access Streets provide access to abutting property. They are not intended to carry heavy volumes of traffic and should be located so that only traffic with origins and destinations on these streets would be served. Local streets may be further classified as either residential, commercial, and/or industrial depending upon the type of land use which they serve.

Minor Thoroughfares are more important streets on the city system. They collect traffic from local access streets and carry it to the major thoroughfares. They may in some instances supplement the major thoroughfare system by facilitating minor through-traffic movements. A third function that may be performed is that of providing access to abutting property. They should be designed to serve limited areas so that their development as major thoroughfares will be prevented.

Major Thoroughfares are the primary traffic arteries of the city. Their function is to move intra-city and inter-city traffic. The streets which comprise the major thoroughfare system may also serve abutting property; however, their principal function is to carry traffic. They should not be bordered by uncontrolled strip development because such development significantly lowers the capacity of the thoroughfare. In addition, each driveway is a danger and an impediment to traffic flow. Major thoroughfares may range from two-lane streets carrying minor traffic volumes to major expressways with four or more traffic lanes. Parking normally should not be permitted here.

Idealized Major Thoroughfare System

A coordinated system of major thoroughfares forms the basic framework of the urban street system. A major thoroughfare system which is very adaptable to desired lines of travel within an urban area is the radial-loop system. It permits movement between various areas of the city with maximum directness. This system consists of several functional elements: radial streets, cross-town streets, loop system streets, and bypasses (Figure 2).

Radial streets provide for traffic movement between points located on the outskirts of the city and the central area. This is a major traffic movement in most cities, and the economic strength of the central business district depends upon the adequacy of this type of thoroughfare.

If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of **cross-town streets** that form a loop around the central business district. This system allows traffic moving from one side of the central area to the other to follow the area's perimeter. It also allows central area traffic to circle and then re-enter the central area nearer to a given destination. The effect of a good cross-town system is to free the central area of cross-town traffic, thus permitting the central area to function more adequately in its role as a business or pedestrian shopping area.

IDEALIZED THOROUGHFARE PLAN

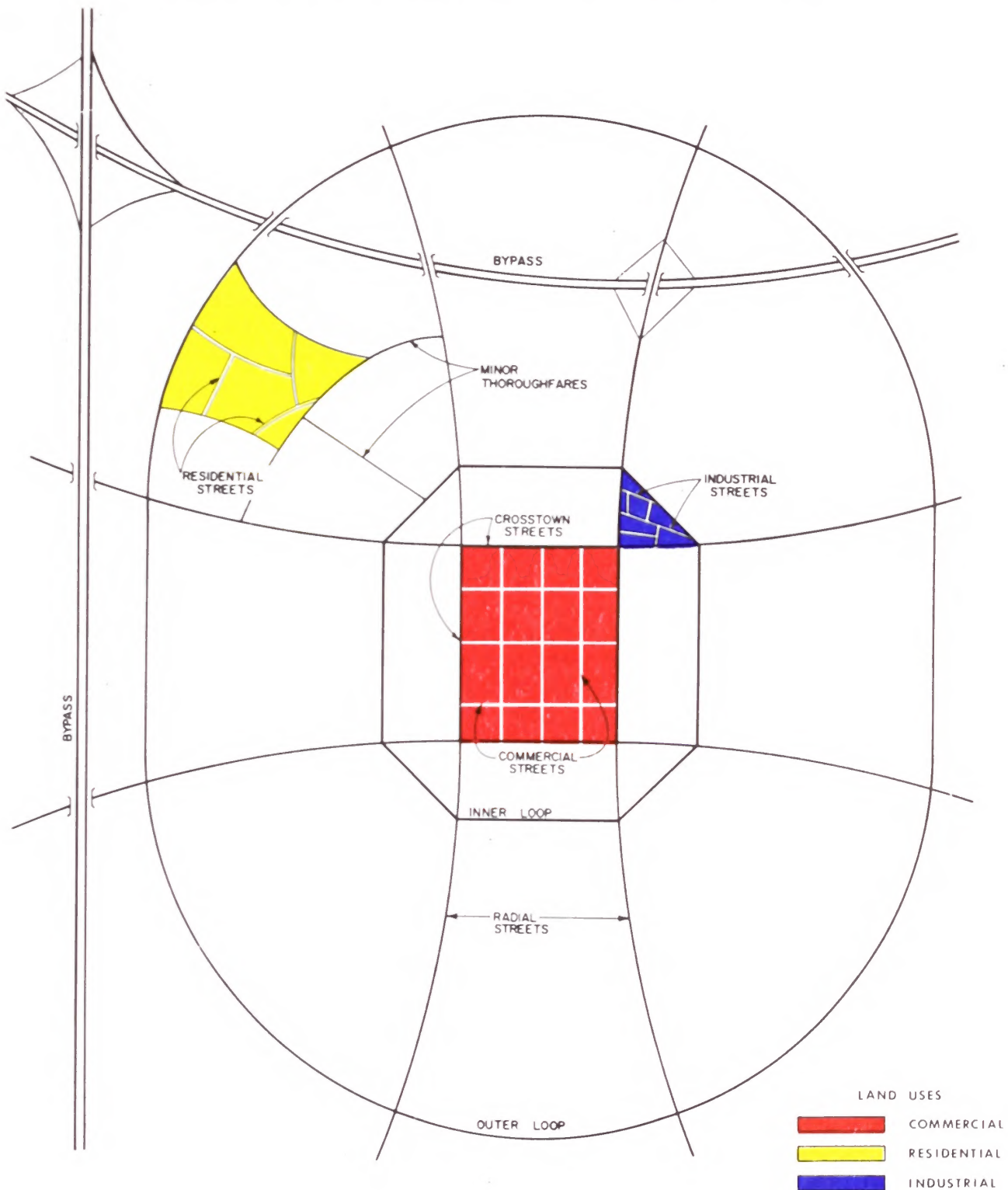


FIGURE 2

Loop system streets move traffic between suburban areas of the city. Although a loop may completely encircle the city, a typical trip may be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not necessarily carry heavy volumes of traffic, but they function to help relieve central area congestion. There may be one or more loops, depending on the size of the urban area. They are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

A **bypass** is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing traffic which has no desire to be in the city. Bypasses are usually designed to through-highway standards, with control of access. Occasionally, a bypass with low traffic volume can be designed to function as a portion of an urban loop. The general effect of bypasses is to expedite the movement of through traffic and to improve traffic conditions within the city. By freeing the local streets for use by shopping and home-to-work traffic, bypasses tend to increase the economic vitality of the local area.

Application of Thoroughfare Planning Principles

The concepts presented in the discussion of operational efficiency, functional classification, and idealized major thoroughfare system are the conceptual tools available to the transportation planner in developing a thoroughfare plan. In actual practice, a thoroughfare plan is developed for established urban areas and is constrained by the existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these constraints and the many other factors that affect major street locations.

Throughout the thoroughfare planning process, it is necessary from a practical standpoint to follow certain basic principles as closely as possible. These principles are as follows:

- (1) The plan should be derived from a thorough knowledge of today's travel - its component parts, as well as the factors that contribute to it, limit it, and modify it.
- (2) Traffic demands must be sufficient to warrant the designation and development of each major street. The thoroughfare plan should be designed to accommodate a large portion of all major traffic movements on relatively few streets.
- (3) The plan should conform to and provide for the land development of the area.

- (4) Certain considerations must be given to urban development beyond the current planning period. In outlying or sparsely developed areas that have development potential, it is necessary to designate thoroughfares on a long-range planning basis to protect rights-of-way for future thoroughfare development.
- (5) While being consistent with the above principles and realistic in terms of travel trends, the plan must be economically feasible.

By adhering to these principles, the thoroughfare plan will encourage economic growth in an area by providing an efficient, cost effective transportation system with a minimal disruption to the physical, social, and economic environments.

3. EXISTING AND PROJECTED CONDITIONS

The Town of Winterville is located in southwestern Pitt County in eastern North Carolina. Winterville lies just to the south of Greenville, a city of just under 50,000 people. The principal route between the two municipalities is NC 11. This roadway is also the main connector between the cities of Greenville and Kinston. Within the Winterville planning area, NC 11 is a four lane, partially controlled-access roadway with intersections at the major cross roads. It is the most heavily traveled roadway in the area. Congestion here is growing due to the alluring suburban lifestyle of the town and the addition of traffic signals along NC 11 at various locations. Winterville is also served by NC 903, which runs in a southwest direction toward Goldsboro. NC 903 is a two lane roadway with sparse residential and agricultural development on either side.

Winterville is also served by several important secondary roads, including Old NC 11, also known as Mill Street (SR 1149), through the downtown area; Old Tar Road (SR 1700) on the eastern side of town; and Reedy Branch Road (SR 1131) to the west. These roadways act as additional connections between Winterville and Greenville and carry heavy traffic loads during the morning and afternoon rush hours. Currently, both residential and commercial/retail development is spreading south from Greenville into Winterville along Old Tar Road. This area is the fastest growing section in the Winterville planning area.

To fulfill the objectives of an adequate 25-year thoroughfare plan, reliable forecasts of future travel characteristics must be made. Such forecasts are possible only when the following major items are carefully analyzed: (1) historic and potential population changes; (2) significant trends in the economy; (3) the character and intensity of land development; and (4) motor vehicle registration and use. With this information, as well as with input from local planners, citizens, and public officials, the transportation engineer can determine the needs of the area and set out to solve the problems that have been identified.

Population Trends

Travel is directly related to population. Population trends and projections for the Town of Winterville, Winterville Township, and Pitt County are given in Table 1. The projections were derived from census figures and extrapolated to the year 2015 using data provided by the Demographics Unit of the Office of State Budget and Management. As shown, the population in this area has been growing at a rapid pace over the past few years. This is due in part to the availability of land in the area and Winterville's proximity to Greenville. This trend is expected to continue well into the next century.

The population in this area is projected to grow quickly over the next 25 years, adding to the congestion on the existing road network. In addition, this congestion will be compounded by the continued growth of nearby communities, including Ayden and Grifton, that use the roads through the Winterville area to access the economic base of jobs in Greenville.

TABLE 1

Population Trends and Projections

Year	Pitt County	Winterville Twp.	Winterville
1940	61,244	3,822	848
1950	63,789	3,595	870
1960	69,942	4,635	1,418
1970	73,900	5,412	1,437
1980	90,146	11,091	2,052
1990	107,924	18,658	3,069
2000	* 128,535	** 26,350	***
2010	* 148,263	** 33,360	***
2015	* 157,531	** 37,800	***

* County population projections from Office of State Budget and Management, State of North Carolina.

** Township population projections based on trends related to County growth.

*** Town population projections not given due to unforeseeable changes, such as annexations.

Employment and Economic Trends

The number of persons residing in any given area is a direct function of the number of jobs available in that area. For example, a decision by a large firm to build an industrial plant employing several hundred people would have an abrupt impact on an area's economy. This is because it would provide a new incentive for people to move into that area. Secondary spin-offs of such a decision would include: an increased demand for new housing and services; increased retail sales and bank deposits; increased school enrollment; increased traffic; and several other benefits and costs associated with urban population growth.

Since it is impossible to predict decisions such as new industrial plant locations in advance of their occurrence, long range projections of population and employment growth are somewhat "iffy." Historically, planners have relied upon the analysis of past trends to arrive at predictions of future ones. However, significant variances in predicted versus actual growth should be taken into account during periodic updates of this study in the future.

According to the figures shown in Table 2, employment in Pitt County has almost doubled over the past two decades. However, as shown in Table 2-A, this was accompanied by a substantial decrease in farm industry employment, indicating that an urbanization process is occurring in this county. This may also indicate that a larger percentage of the employed persons in Pitt County are traveling to and from a non-home-based workplace during the morning and afternoon rush hours, putting a larger strain on the road system now than in past years.

TABLE 2

Employment Trends in Pitt County *

Year	Total Employ.	Farm Employ.	Non-farm Employment		
			Total	Private	Gov't
1970	32,116	6,605	25,511	19,851	5,660
1975	36,710	5,575	31,135	23,451	7,684
1980	42,846	3,765	39,081	28,987	10,094
1985	49,435	2,767	46,668	34,879	11,789
1990	62,141	2,018	60,123	44,379	15,744

* Figures from the Bureau of Economic Analysis

TABLE 2-A

**Farm Versus Non-farm Employment *
as a Percentage of the Total Employment in Pitt County**

Year	% Farm Employment	% Non-farm Employment
1970	20.6	79.4
1975	15.2	84.8
1980	8.8	91.2
1985	5.6	94.4
1990	3.2	96.8

* Figures from Bureau of Economic Analysis

Land Use Trends

The generation of traffic on a particular thoroughfare is very closely related to the use of adjacent land areas. Some types of land uses generate much more traffic than others. For example, a commercial or retail area such as a shopping center will generate (or attract) much larger volumes of traffic than a residential area. The attraction between different land uses

varies with the intensity of development and the distance between those developed areas. Therefore, it becomes necessary to designate land uses by type for transportation planning. An analysis of the distribution of existing land uses serves as a basis for forecasting future land use needs and the resulting travel patterns.

The Town of Winterville is currently in transition from a small farming town to a suburban bedroom community of the City of Greenville. This change has brought about an increased dependence upon the automobile for every-day living, as a growing percentage of the population consists of commuters. This commuting population has had a profound effect on various north-south routes that were once thought of as low volume, rural roads, including Reedy Branch Road (SR 1131), Old Tar Road (SR 1700), and County Home Road (SR 1725). In addition, as development stretches southward from Greenville, Old Tar Road and, eventually, County Home Road (SR 1725) will experience additional development-related traffic.

Vehicle Registration Trends

Vehicle registration has increased at a much greater rate than population since the 1940's. This increase can be shown best by a graph depicting the change in the persons per vehicle ratio over time. This ratio is obtained by dividing the total population of the area by the total number of vehicles registered in that area. Figure 3 shows this comparison for North Carolina and Pitt County and includes projections to the year 2015. The results illustrate the transition from a non-automobile oriented society to one whose vitality is heavily dependent on the automobile.

Traffic Accidents

Traffic accident analysis is an important consideration in the development of a thoroughfare plan, since accident records can aid in locating problem areas on the highway system. The source of traffic accidents can be broken down into three general categories. The first is the physical environment, including such things as road condition, weather, roadway obstructions, and traffic conditions. The second source is associated with the driver. This includes the driver's mental alertness, distractions in the car, the ability to handle the vehicle, and reaction time. The third source is associated with the physical attributes of the vehicle itself. This would include such things as the condition of the brakes and tires, vehicle responsiveness, size of the vehicle, and how well the windshield wipers and defroster work. All traffic accidents can be attributed to one or more of these sources; however, the driver is often the primary source.

PERSONS PER VEHICLE TRENDS FOR NORTH CAROLINA AND PITT COUNTY

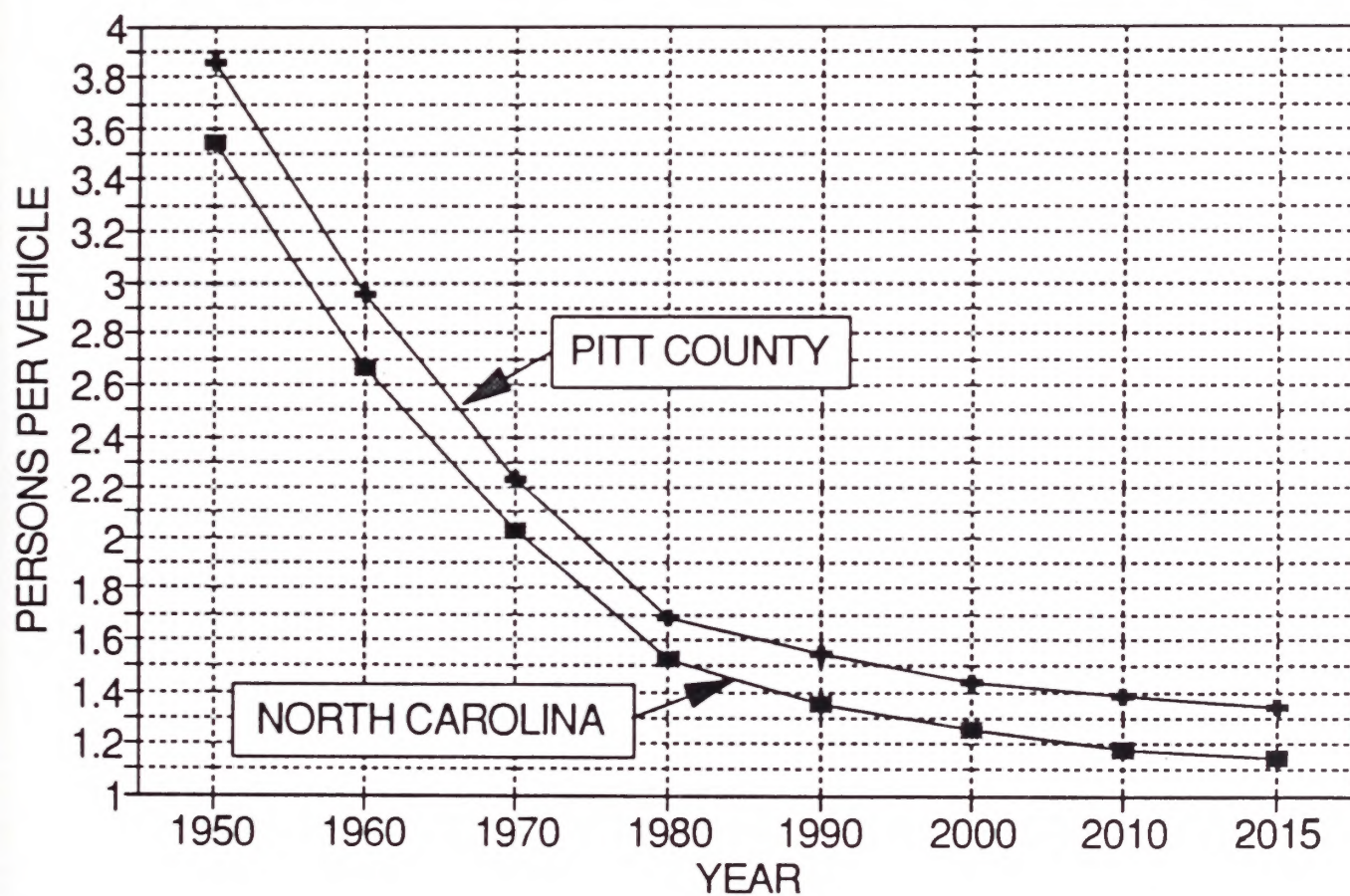


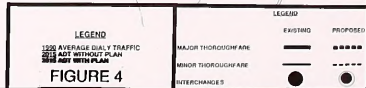
FIGURE 3

Accident data for a three year period, from January, 1989, through December, 1991, was studied while developing the Town's thoroughfare plan. NCDOT's Intersection Accident Listing lists 12 intersections in the Winterville planning area that had 5 or more accidents within this period. These intersections are listed in Table 3.

TABLE 3	
Intersections with 5 or More Accidents	
NC 11 @ Fire Tower Road (SR 1708).....	15
Old Tar Road (SR 1700) @ Fire Tower Road (SR 1708).....	13
NC 11 @ Reedy Branch Road (SR 1131).....	12
Cooper Street (SR 1711) @ County Home Road (SR 1725).....	12
NC 11 @ Mill Street (SR 1149).....	10
Main Street (SR 1133) @ Mill Street (SR 1149).....	9
NC 11 @ NC 903.....	7
Frog Level Road (SR 1127) @ Davenport Farm Road (SR 1128)	6
Davenport Farm Road (SR 1128) @ Reedy Branch Road (SR 1131)	6
G. A. Forlines Road (SR 1126) @ Reedy Branch Road (SR 1131)	5
Whitehurst Road (SR 1129) @ Reedy Branch Road (SR 1131).....	5
Cooper Street (SR 1711) @ Old Tar Road (SR 1700).....	5

Travel Demand

Travel demand is generally reported in the form of average daily traffic counts. Traffic counts are taken regularly at several locations in and around the Winterville planning area by the North Carolina Department of Transportation. From these trends and with the previously discussed factors in mind, future travel demand in the Winterville area was estimated. Average daily traffic figures for 1990 and projections for the year 2015 for various locations are shown in Figure 4. The analysis of these projections will be discussed in the next chapter.



PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS, PLANNING AND DESIGN DIVISION

4. DEVELOPMENT OF THE THOROUGHFARE PLAN

During the development of a thoroughfare plan, there are many concerns and issues that must be evaluated before a final plan can be recommended and adopted. This chapter will identify both the transportation and environmental concerns that were studied.

Capacity Analysis

A good indication of the adequacy of the existing major street system is a comparison of the traffic volumes with the ability of the streets to move traffic freely and at a desirable speed. Capacity is defined as the maximum number of vehicles that are expected to pass over a given section of roadway during a given time period under prevailing roadway and traffic conditions. The relationship of traffic volumes to the capacity of the roadway will determine the **level-of-service** being provided. A level-of-service is a qualitative measure describing the operating conditions within a traffic stream and their perception by motorists and/or passengers. Six levels of service are used to identify the conditions existing along a highway or street. These levels of service are illustrated in Figure 5.

A level-of-service (LOS) definition generally describes the roadway operating conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with level-of-service A representing the best operating conditions and level-of-service F, the worst. The various levels of service are defined below for uninterrupted flow facilities, but the basic concepts apply to all roads.

Level-of-Service A represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

Level-of-Service B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

Level-of-Service C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions

with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this point.

Level-of-Service D represents high-density, but stable, flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

Level-of-Service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

Level-of-Service F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level-of-service F is used to describe the operating conditions within the queue, as well as the point of breakdown. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good. Nevertheless, it is the point at which arrival flow exceeds discharge flow that causes the queue to form, and level-of-service F is an appropriate designation for such points.

The recommended improvements in the Thoroughfare Plan were based on achieving a minimum LOS D on existing facilities and LOS C on new facilities. LOS D is considered the **practical capacity** of a facility, or that point at which the public begins to express dissatisfaction.

There are several locations in the Winterville area that will experience capacity problems within the 25-year design period. These include sections of NC 11, Tar Road (SR 1700), and Mill Street (SR 1149). If the street system in this area remains as it is today, then these roads will be over-capacity, or experiencing level-of-service F, by the year 2015. This breakdown in the system would result in stop-and-go traffic as well as increases in accident frequency, air pollution, travel times, automobile operating costs, and frustration levels.



LEVEL OF SERVICE - A



LEVEL OF SERVICE - B



LEVEL OF SERVICE - C



LEVEL OF SERVICE - D



LEVEL OF SERVICE - E



LEVEL OF SERVICE - F

LEVELS OF SERVICE

FIGURE 5

The proposed Winterville Bypass and the widening of both Tar Road and Mill Street will alleviate the congestion problems on these roads in the future. In addition to these roads, NC 903 between NC 11 and the proposed Winterville Bypass may also need widening to relieve congestion problems after the Bypass is built.

No other facilities in the area are expected to have congestion problems in the design period. However, it is recommended that many of these roads be widened to the secondary road standard of 12-foot lanes. See the Street Inventory and Recommendations in Appendix B for a complete list of these roads.

System Deficiencies

In addition to capacity deficiencies, there are system deficiencies which result from the lack of a cohesive, continuous, and complementary major street network. The following system deficiencies were identified in the existing Winterville street system:

1. The lack of a direct east-west crosstown route;
2. The lack of a loop facility on the south and east sides of town;
3. The lack of connectors between NC 11 and the residential neighborhoods to the south of downtown.

System deficiencies such as these can contribute to locally congested areas, increased vehicle operating costs, increased travel time, and neighborhood cut-through traffic.

NC 903/Main Street (SR 1133), which bisects the town from east to west, ends abruptly at Old Tar Road (SR 1700). To continue east, one must switch over to Cooper Street (SR 1711) somewhere between Mill Street (SR 1149) and Old Tar Road. This movement involves either cutting through a residential neighborhood or using the already congested Old Tar Road to make the change. Neither is a good solution. For this reason, an extension of Main Street has been proposed to allow for a more direct crosstown route.

Another problem with the current road system is the inability to easily access eastern Greenville, especially during the morning and afternoon rush hours. A large portion of this traffic travels on NC 11 to its intersection with Fire Tower Road (SR 1708) and then utilizes a congested Fire Tower Road to access eastern Greenville. By connecting several secondary roads on the southeastern side of town, a loop facility is created which avoids the busy NC 11/Fire Tower Road intersection and still provides access to eastern Greenville.

The final major system deficiency noted was the lack of access points to NC 11 from areas just south of Winterville.

This area will most likely experience increased residential development in the coming years, and access to NC 11 needs to be improved to handle the additional traffic. For this reason, two new access points were recommended: an extension of Carroll Street (SR 1713) and an extension of part of Reedy Branch Road (SR 1131).

Environmental Considerations

The legislation that dictates the necessary procedures regarding environmental impacts is the National Environmental Policy Act. Section 102 of this act requires the execution of an environmental impact statement, or EIS, for road projects that have a significant impact on the environment. The EIS would then be reviewed by various federal and state agencies. Included in an EIS would be the project's impact on wetlands, water quality, historic properties, wildlife, and public lands. While this report does not cover the environmental concerns in as much detail as an EIS would, preliminary research was done on several of these factors and is included below.

Wetlands¹

In general terms, wetlands are lands where saturation with water is the dominant factor in determining the nature of soil development and the types of plant and animal communities living in the soil and in its surface. The single feature that most wetlands share is soil or substrate that is at least periodically saturated with or covered by water. The water creates severe physiological problems for all plants and animals except those that are adapted for life in water or in saturated soil.

Wetlands are crucial ecosystems in our environment. They help regulate and maintain the hydrology of our rivers, lakes, and streams by slowly storing and releasing flood waters. They help maintain the quality of our water by storing nutrients, reducing sediment loads, and reducing erosion. They are also critical to fish and wildlife populations. Wetlands provide an important habitat for about one third of the plant and animal species that are federally listed as threatened or endangered.

In this study, the impacts to wetlands were determined using the National Wetlands Inventory Mapping, available from the U.S. Fish and Wildlife Service. The location of wetlands in the Winterville and Ayden planning areas is shown in Figure 6.

¹ Dahl, T.E. and C.E. Johnson, Status and Trends of Wetlands in the Conterminous United States, Mid-1970's to Mid-1980's. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C., 1991.

Wetland impacts have been avoided or minimized to the greatest extent possible while preserving the integrity of the transportation plan. As shown Figure 6, there are no major wetland crossings within the Winterville planning area. The project with the greatest potential wetland impacts is the Winterville Bypass, which may impact wetlands in the Horsepen and Gum Swamp areas.

Threatened and Endangered Species

A preliminary review of the Federally Listed Threatened and Endangered Species within the Winterville planning area was done to determine the effects new corridors could have on the wildlife. Currently, no threatened or endangered species have been located within the planning area. However, there is one animal species in the area, a type of crayfish whose technical name is *procambarus medialis*, that has been listed as a special concern in North Carolina. This species was found in Swift Creek and could occur in other area streams.

The Threatened and Endangered Species Act of 1973 allows the U.S. Fish and Wildlife Service to impose measures on the Department of Transportation to mitigate the environmental impact of a road project on endangered plants and animals and critical wildlife habitats. By locating rare species in the planning stage of road construction, we are able to avoid or minimize these impacts.

Historic Sites

The location of historic sites in the Winterville planning area was investigated to determine the impacts of the alternatives studied. The federal government has issued guidelines requiring all State Transportation Departments to make special efforts to preserve historic sites. In addition, the State of North Carolina has issued its own guidelines for the preservation of historic sites. These two pieces of legislation are described below:

National Historic Preservation Act - Section 106 of this act requires the Department of Transportation to identify historic properties listed in the National Register of Historic Places and properties eligible to be listed. The DOT must consider the impact on these properties of its road projects and consult with the Federal Advisory Council on Historic Preservation.

NC General Statute 121-12(a) - requires that the DOT identify historic properties listed on the National Register, but not necessarily those eligible to be listed. DOT must consider impacts and consult with the North Carolina Historical Commission, but it is not bound by their recommendations.

There are no properties in the Winterville planning area listed on the National Register of Historic Places. However, there are three houses on the Study List that might be registered sometime in the future. These are as follows:

- * Charles McLawhorn House - located on the northwest side of NC 903, 0.35 miles west of Frog Level Road (SR 1127);
- * Alfred McLawhorn House - located on the east side of Reedy Branch Road (SR 1131), 0.40 miles south of NC 903;
- * Speir Washington, Jr., House - located on the south side of Carroll Street (SR 1713), 0.10 mile east of Old Tar Road (SR 1700).

It has been determined that none of the proposed roads will impact these houses. In all construction projects, care should be taken to make certain that historic sites and natural settings are preserved. Therefore, a closer study should be done in regard to historic sites just prior to the construction of any proposal.

Air and Noise Pollution

The design of a thoroughfare system can have a significant effect on the amount of pollutants added to the atmosphere. Pollutant emissions are reduced when traffic is permitted to flow smoothly and by the reduction of congestion and stop-and-go conditions. This reduction of pollutants is created by the more efficient use of fuel offered by free-flow conditions.

The control of noise pollution in the vicinity of residential neighborhoods is another important aspect of transportation planning. By designating certain routes as thoroughfares, we are able to direct the heaviest flows of traffic through areas that are amenable to or even desire such traffic. This reduces the noise from automobile and truck traffic in areas where quiet surroundings are desired.

Air and noise pollution levels will increase the most along the major routes, including NC 11, Main Street (SR 1133), and Old Tar Road (SR 1700), but this will be offset by the reduction in noise and air pollutants on streets and in residential neighborhoods from which the bypass traffic is transferred. If the thoroughfare plan is implemented, the overall air and noise quality for the Winterville area should be better due to the improved traffic operating conditions along both the new and existing routes.



5. MUNICIPAL AND PUBLIC INVOLVEMENT

Previous to this thoroughfare planning study, the Town of Winterville had a mutually adopted thoroughfare plan dating from mid-1970. Due to the increasing development of Winterville as a bedroom community of Greenville and the traffic problems associated with this, the Town requested an update of their Plan on November 15, 1989. Over the past two decades, several of the previously planned projects had become obsolete or unbuildable due to changes in the growth patterns in the area. Also, since Winterville is growing at such a rapid pace, new facilities would be needed to divert traffic from both residential and downtown areas.

Work was started in April, 1990, by the Statewide Planning Branch of the North Carolina Department of Transportation. Because of the proximity of Winterville to the Towns of Ayden and Grifton, it was decided that the three plans should be studied concurrently to provide for the most cohesive and integrated road network possible. In addition, several different groups were actively involved in the planning process, including, but not limited to: the Town Planning Board, the Town Board of Aldermen, the North Carolina Department of Economic and Community Development, the North Carolina Department of Transportation, and the general public.

On January 23, 1991, a joint planning board meeting was held with representatives from the Towns of Winterville, Ayden, and Grifton, Pitt County, the NC Department of Economic and Community Development, and the NC Department of Transportation to discuss thoroughfare planning in general and specific problems or concerns that were perceived as crucial to their transportation plan. Copies of the previous thoroughfare plans were presented and discussed, along with current traffic counts and accident statistics in the region. Interest was also high on Greenville's Thoroughfare Plan, which had recently been adopted. Among the proposals suggested at the meeting for Winterville were the widening of Fire Tower Road (SR 1708), the widening of Old Tar Road (SR 1700), and a fully controlled-access bypass that avoids the intersection of NC 11 and Fire Tower Road.

On June 3, 1991, a planning board meeting was held with the Town of Winterville, the NC Department of Economic and Community Development, and NCDOT. At this meeting, problems specific to Winterville were identified and discussed. Among the suggestions at this meeting were: widening Old Tar Road (SR 1700) to five lanes due to increased residential development in that area; widening Main Street (SR 1133) to three lanes due to a new post office; and extending Main Street east through its intersection with Old Tar Road to a connection with Cooper Street (SR 1711). Other concerns included the intersection of NC 11, Mill Street (SR 1149) and Vernon White Road (SR 1130); drainage problems on Boyd Street (SR 1129); speeds on Reedy Branch Road (SR 1133) between NC 11 and Mill Street; and the accident severity at

various rural intersections.

On November 4, 1991, preliminary recommendations were presented to the Winterville Planning Board for discussion. A relocation of the western end of Vernon White Road was on this list, but was later removed because it would interfere with a proposed residential subdivision. In addition, a more direct connection between NC 11 and the proposed eastern bypass was requested to provide an easier route for travelers from southern Pitt County to eastern Greenville.

On February 3, 1992, the modified thoroughfare plan recommendations were presented. The Winterville Planning Board formally accepted these recommendations and agreed to present them to the Town Board of Aldermen along with any comments received during an upcoming public hearing.

On May 11, 1992, a "drop-in" session was held in the Winterville Town Hall from 3 to 6 P.M. to allow citizens the chance to talk with the town planner and a representative from the NC Department of Transportation about the proposed thoroughfare plan. Also, at 7:30 that evening, a public hearing was held at the same location to formally receive comments regarding the plan. Both meetings were advertised in the newspaper prior to their occurrence. While only four people attended the "drop-in" session, approximately 40 people attended the public hearing. There was very vocal opposition to the widening of Old Tar Road through Winterville by several people who lived along the road. However, it appeared that the majority of attendees, including several others who also lived along the road, were in favor of the proposal. After almost an hour of discussion, the Winterville Board of Aldermen, seeing that the plan was a necessary and needed planning tool and in the best interest of the community as a whole, adopted it unanimously.

Currently, the Town of Winterville is in the process of implementing the "3-C" Process as part of the newly formed Greenville Urbanized Area. As part of an area with greater than 50,000 population, Winterville will have a stronger voice in future area transportation projects and may receive additional funding for transportation planning.

6. RECOMMENDATIONS

The following is a list of roads that are recommended to serve as major and minor thoroughfares for Winterville as discussed in Chapter II. A description of each proposed improvement is included, followed by a brief discussion of the road's function and deficiencies. More detail on the physical and operational characteristics of each facility is given in the Street Inventory and Recommendations section, Appendix B. The mutually adopted thoroughfare plan is shown in Figure 7.

Major Thoroughfares

Winterville Bypass - Construct a 4-lane divided facility on new location. This fully controlled access highway will connect with the Greenville Southwest Loop at Davenport Farm Road, continue southward to an interchange at NC 903, and then join NC 11 just south of the Swift Creek bridge. This facility will be needed in approximately 15 years.

As NC 11 becomes more congested and traffic signals are installed at the major cross streets, the capacity and speed of this road will greatly diminish. An alternate route, with full control of access, will be needed to provide through traffic with better access to Greenville's proposed loop system. This facility, in conjunction with Greenville's proposed Southwest Loop, will also provide residents of this area with a quicker and more direct access to the businesses and medical center in western Greenville.

Fire Tower Road (SR 1708)/Davenport Farm Road (SR 1128) - Widen existing Fire Tower Road to five lanes; construct a 3-lane extension of Fire Tower Road from NC 11 to Davenport Farm Road (SR 1128) west of Reedy Branch Road (SR 1131); and widen Davenport Farm Road to three lanes from Fire Tower Road Extension to the Greenville Southwest Loop.

Traffic volumes and congestion on the existing sections of Fire Tower Road demand additional lanes immediately. This proposal is also listed in the Greenville Urban Area Thoroughfare Plan. The extension of Fire Tower Road and the upgrade of Davenport Farm Road will provide an improved connection to the proposed Greenville Southwest Loop and the Winterville Bypass.

Old Tar Road (SR 1700) - Widen the existing roadway to a five-lane cross section from Fire Tower Road (SR 1708) to Reedy Branch Road (SR 1131). This can be done in stages as needed. The northernmost section is needed immediately.

Old Tar Road is one of the main north-south routes between Greenville and Winterville. The amount of traffic this road now carries is substantial and will soon exceed the practical capacity of the road. In addition, the major thrust of

development in Winterville, both residential and commercial/retail, seems to be occurring along this road. A new shopping center near the corner of Main Street and Old Tar Road will add greatly to the attractiveness of this part of town and, thus, contribute to its congestion. By widening this roadway to five lanes, needed additional travel capacity will be provided and the left-turning movements along the route will cease to hinder the smooth flow of traffic.

NC 11 - Due to the anticipated diversion of traffic onto the proposed Winterville Bypass, no widening is considered necessary for NC 11 within this 25-year design period.

Main Street (SR 1133) - Widen existing roadway to 3 lanes, including a center turn lane. Since the roadway in the central business district is already 36 feet wide, no construction will be necessary for the first stage of this project.

As traffic on this roadway increases, access to the abutting property will become a crucial factor hindering the smooth flow of through-traffic. Also, new development along Main Street, including a new Post Office, will add to the congestion and turning movements in the area. A center turn lane will reduce the impact of these left turning vehicles.

Main Street Extension (SR 1133) - Connect the eastern end of Main Street, at the intersection of Old Tar Road (SR 1700), with Cooper Road (SR 1711) to provide a continuous east-west movement through Winterville.

This connection will provide a more direct route through Winterville, eliminating the need to make an offset movement onto and off of Tar Road at the existing Cooper Road and Main Street intersections.

NC 903 - Widen the existing roadway to 24 feet from NC 11 to the western planning boundary near SR 1127. When the Winterville Bypass is built, widen NC 903 between the Bypass and NC 11 to a five lane cross section.

Due to the proposed interchange with the Winterville Bypass, NC 903 will become one of the main routes into downtown Winterville. The increased traffic on this roadway will necessitate the widening of this roadway to accommodate the increased traffic movements.

Eastern Loop - Extend Reedy Branch Road (SR 1131) west from its intersection with Old NC 11 (SR 1149) to NC 11. Connect Jack Jones Road (SR 1715) with Reedy Branch Road at Old Tar Road (SR 1700). Reconstruct intersection of Jack Jones Road and County Home Road (SR 1725) to allow the primary traffic movement to flow from Jack Jones Road to north-bound County Home Road. Realign sharp curves along this route and widen the existing roads to meet secondary road standards. If conditions warrant,

widen County Home Road to a multi-lane cross section.

The addition of a direct connection between NC 11 and Old NC 11 at the Reedy Branch Road intersection on the southern side of town, along with the connection of these Secondary Roads, will provide a continuous circumferential route to the south and east of Winterville. Growth in this area is expected to be quite high, and this roadway will provide a direct connection for the residents of southern Winterville and northern Ayden to eastern Greenville. It will also allow traffic coming north on NC 11 and wishing to access eastern Greenville to avoid the congestion of northern Winterville, especially Fire Tower Road.

Like Old Tar Road, County Home Road is expected to develop rapidly in the coming years, although not to such an extent. If development along County Home Road is extreme, the widening of this roadway to a multi-lane facility may be warranted.

Mill Street (SR 1149) - Widen existing roadway to 5 lanes to accommodate future traffic. This project will be needed in approximately 10 years.

Traffic volumes on this roadway, currently between 6,000 and 7,000 vehicles per day within the town limits of Winterville, will exceed the practical capacity for a two lane road in the next 10 years. The projected traffic volumes indicate a need for additional lanes on this roadway in the near future.

Minor Thoroughfares

Carrol Street Extension (SR 1713) - Extend Carrol Street from Mill Street (SR 1149) to NC 11 as southeast Winterville develops.

This connection will provide the future residents of southern Winterville with a direct access onto NC 11. As the area southeast of Winterville develops, this connection will redirect traffic that would have used the already congested Main Street or Mill Street intersections as their accesses to NC 11.

Boyd Street (SR 1129) - Widen the existing roadway to 24 feet from NC 11 to Railroad Street and improve the inadequate drainage conditions.

This street is important because it is the primary access road for Robinson Elementary School. Due to the number of school buses that travel along this route, widening for safety purposes is recommended. Also, by improving the roadway, it is hoped that the drainage problems will also be solved.

Jolly Road (SR 1120) - Minor widening will be needed along this roadway. See "Other Projects."

Gene Allen Forlines Road (SR 1126) - Minor widening will be needed along this roadway. See "Other Projects."

Laura Ellis Road (SR 1713) - Minor widening will be needed along this roadway. See "Other Projects."

Cooper Street - Minor widening will be needed along this roadway. See "Other Projects."

Vernon White Road (SR 1130) - No improvements will be necessary on this roadway in the design period.

Railroad Street - No improvements will be necessary on this roadway in the design period.

Other Projects

Intersection of NC 11, Mill Street (SR 1149), and Vernon White Road (SR 1130) - A traffic signal study is needed at this intersection to improve the flow of the currently conflicting traffic pattern.

As traffic in this area increases, the left-turning movements from NC 11 onto Vernon White Road will be blocked by traffic on Mill Street waiting at the traffic signal. One possible solution is to stop the north-bound traffic on Mill Street just south of Vernon White Road instead of at NC 11 and provide an additional coordinated signal here. This would allow for easier access to Vernon White Road without creating adverse side-effects on Mill Street.

Minor widening - Widen sections of the following two lane roads to 24 feet to meet secondary road standards and for capacity, safety, and driver comfort reasons:

SR 1120, Jolly Road	SR 1131, Reedy Branch Road
SR 1125, Pocosin Road	SR 1711, Cooper Street
SR 1126, Gene Allen Forlines Rd	SR 1712, Ange Street
SR 1127, Frog Level Road	SR 1713, Laura Ellis Road
SR 1128, Davenport Farm Road	SR 1714, Church Street Ext

Traffic islands - Traffic islands with stop signs are needed at several rural intersections to prevent missed stops and fatal high speed accidents.

Reedy Branch Road and Davenport Farm Road, (SR 1131 and SR 1128) - 6 accidents have occurred at this intersection during the past three years with a higher than usual severity.

Reedy Branch Road and Gene Allen Forlines Road, (SR 1131 and SR 1129) - 5 accidents have occurred here in the past three years.

Road Paving Projects - A portion of the Highway Trust Fund goes toward the paving of secondary roads throughout the state. Originally, all unpaved roads carrying more than 50 vehicles per day were to have been paved by the year 2000, with the balance of roads being paved by 2006. While this time frame has been altered slightly due to a revenue shortfall, the basic goals of the program are still in place.

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7. CONSTRUCTION PRIORITIES, USER BENEFITS, AND COST ESTIMATES

The improvements suggested in a thoroughfare plan obviously cannot be undertaken all at once, nor should they be. The cost would be overwhelming and the need for some of the projects is not immediate. In an effort to reflect the relative value of various improvements, an assessment has been made of the benefits that can be expected from each project. These benefits can then be compared to the costs involved and a priority listing developed.

Three principal measures were used to estimate the benefits that would be derived from each project: road user cost savings, the potential for increased economic development resulting from the improvement, and the environmental impacts, both positive and negative, which may result. The first measure is an estimate of actual dollar savings, while the others are estimates of the probability of the resulting change. These measures are described below.

Reduced road user costs should result from any roadway improvement, from a simple widening to the construction of a new roadway to relieve congested or unsafe conditions. Comparisons of the existing and the proposed facility have been made in terms of vehicle operating costs, travel time costs, and accident costs. These user benefits are computed as total dollar savings over a typical 20-year project life expectancy using data such as project length, base year and design year traffic volumes, traffic speed, type of facility, and volume/capacity ratio.

The impact of a project on economic development potential is denoted as the probability that it will stimulate the economic development of an area by providing access to land with development potential and reducing transportation costs. It is a subjective estimate based on the knowledge of the proposed project, local development characteristics, and land development potential. The probability is rated on a scale from 0 (none) to 1.00 (excellent), along with the following intermediate levels:

TABLE 4	
Probability Estimation Guide	
Subjective Evaluation	Success or Impact Probability
-----	-----
Excellent, highest	1.00
Very good, very substantial	.75
Good, substantial, considerable	.50
Fair, some	.25
Poor, none	.00

The environmental impact analysis considers the effect of a project on the physical, social/cultural, and economic environment. Table 5 lists the items that are considered when evaluating the impact on the environment. Many of these have been accounted for in evaluating the project with respect to user benefits, cost, and economic development potential. However, twelve environmental factors are generally not considered in these evaluations. They are the environmental impacts of a project on: (1) air quality, (2) water resources, (3) soils and geology, (4) wildlife, (5) vegetation, (6) neighborhoods, (7) noise, (8) educational facilities, (9) churches, (10) parks and recreational facilities, (11) historic sites and landmarks, and (12) public health and safety. The summation of both positive and negative impact probabilities with respect to these factors provides a measure of the relative environmental impact of a project.

TABLE 5
Environmental Considerations
Physical Environment

Air quality
Water Resources
Soils and Geology
Wildlife
Vegetation
Social and Cultural Environment

Housing
Neighborhoods
Noise
Educational Facilities
Churches
Parks and Recreational Facilities
Public Health and Safety
National Defense
Aesthetics
Economic Environment

Businesses
Employment
Economic Development
Public Utilities
Transportation Costs
Capital Costs
Operation and Maintenance Costs

Offsetting the benefits that would be derived from any project is the cost of its construction. A new facility, despite its high projected benefits, might prove to be unjustified due to the excessive costs involved in construction. The highway costs estimated in this report are based on the average statewide construction costs for similar project types. A rough estimate of anticipated right-of-way costs is also included. Table 6 evaluates the major proposed projects in the Winterville planning area with respect to user benefits, estimated costs, probability of economic development, and environmental impact.

Many considerations go into the evolution of a project from initial idea to construction. Political, social, environmental, and economic considerations have varying amounts of influence at different points in time. For this reason, the adoption of a thoroughfare plan does not explicitly include priorities. However, priorities based on the factors already mentioned have been provided to help both the state and the municipality in their efforts to implement the improvements recommended in this report. Table 6 also ranks the major projects in three priority groups.

Priority group 1 consists of those projects aimed at alleviating the traffic congestion problems on existing roadways. This includes the widening of Old Tar Road (SR 1700) and the widening and extension of Fire Tower Road (SR 1708) to Davenport Farm Road (SR 1128). Implementation of these proposals should be undertaken sometime within the next 5 years, due to the growing development in this area.

Priority group 2 includes those projects that should improve the flow of traffic through and around Winterville. The widening of Mill Street and the extension and widening of Main Street will improve access to and through the downtown area. These two roadways bisect Winterville and need to provide a decent level of travel service in order to discourage residential cut-through traffic. The Winterville Bypass will provide a fully controlled-access route for longer distance travelers wishing to avoid the congestion and traffic signals along the existing NC 11. It will also provide the residents of Winterville with a connection into the Greenville Southwest Loop, thus improving access to western Greenville.

Priority group 3 consists of two longer range projects that will need to be implemented as Winterville expands to the south. The Eastern Loop will connect the main radial streets that lead into downtown Winterville and also provide a bypass route leading into eastern Greenville. The widening of NC 903, while not justified yet from a cost standpoint, will eventually be needed to alleviate the congestion that is anticipated between central Winterville and the Winterville Bypass.

These projects and their priorities are shown in Figure 8.

TABLE 6 - BENEFITS ANALYSIS AND CONSTRUCTION PRIORITIES

WINTERVILLE	LENGTH (mi.)	EXIST. X-SECT.	PROP. X-SECT.	PROP. ACCESS CONTROL	COSTS (x \$1,000)			BENEFITS (x \$1,000)	PROBABLE IMPACTS		
					CONST.	ROW	TOTAL		Econ. Develp	Environmental	
PRIORITY GROUP 1:											
Old Tar Road widening (SR 1700)	3.40	20' (2L)	D (5L)	none	4,420	130	4,550	6,075	0.75	0.40	0.30
Fire Tower Road (SR 1708)	2.93	22' (2L)	D (5L)	none	3,220	280	3,500	10,631	0.90	0.40	0.40
Davenport Farm Road (SR 1128)		20' (2L)	I (3L)								
PRIORITY GROUP 2:											
Winterville Bypass	3.68	N/A	A (4LD)	full	7,360	535	7,895	64,476	0.50	0.20	0.50
Mill Street widening (SR 1149)	6.88	20' (2L) 44' (2LP)	D (5L)	none	3,120	0	3,120	4,668	0.30	0.20	0.20
Main Street widening (SR 1133)	1.38	36' (2LP)	I (3L)	none	520	0	520	1,015	0.30	0.20	0.20
Main Street extension (SR 1133)	0.64	N/A	L (2L)	none	640	25	665	2,060	0.30	0.15	0.30
PRIORITY GROUP 3:											
Eastern Loop	7.68	var (2L)	L (2L)	none	1,560	55	1,615	3,927	0.40	0.20	0.20
NC 903 widening	1.81	20' (2L)	D (5L)	none	2,350	45	2,395	995	0.40	0.20	0.30

Key to abbreviations:

Exist. X-Sect. - Existing roadway cross-section

2L - two lane road

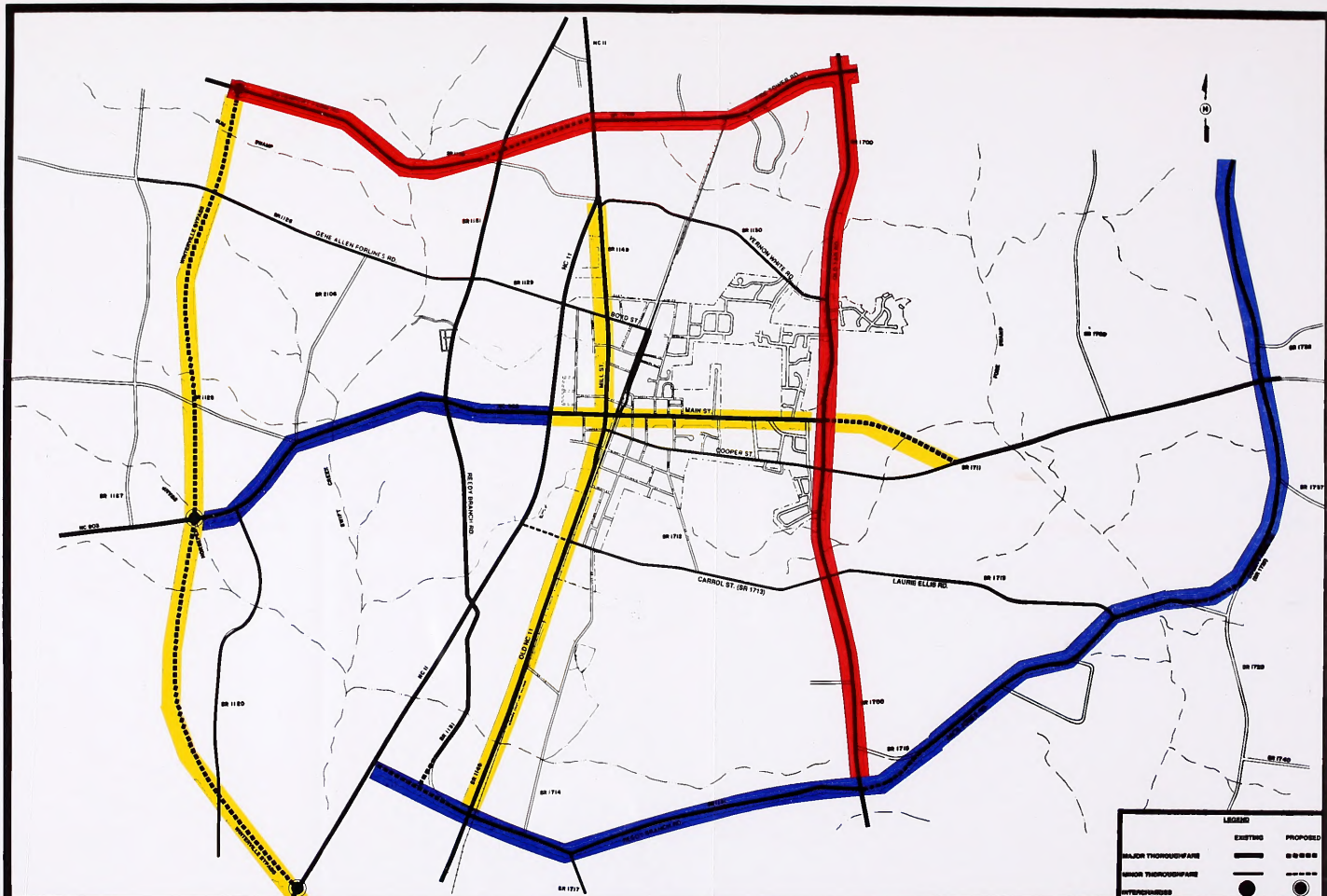
2LP - two lane road with parking on one or both sides

Prop. X-Sect. - Proposed roadway cross-section

D, I, A, L - See Appendix A, Figure A-1, for illustrations of these typical thoroughfare cross-sections

2L, 3L, 5L - two, three, or five lane roadway

4LD - four lane divided controlled-access roadway with grass median



LEGEND

- PRIORITY GROUP 1
- PRIORITY GROUP 2
- PRIORITY GROUP 3

CONSTRUCTION PRIORITIES FOR FOR MAJOR THOROUGHFARES

FIGURE 8

ADOPTED BY:
TOWN OF WINTERVILLE MAY 11, 1992

RECOMMENDED FOR APPROVAL BY: *planning*
STATESIDE PLANNING BRANCH, MAY 18, 1992

ADOPTED BY:
DEPT. OF TRANSPORTATION JULY 18, 1992

PUBLIC MEETING: MAY 11, 1992

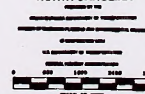
PUBLIC HEARING: MAY 11, 1992

MAY 11, 1992

LEGEND	
EXISTING	PROPOSED
MAJOR THOROUGHFARE	-----
MINOR THOROUGHFARE	-----
HYPERMILEAGE	-----

THOROUGHFARE PLAN WINTERVILLE

PITT COUNTY
NORTH CAROLINA



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8. IMPLEMENTATION

Implementation is one of the most important aspects of the transportation plan. Unless implementation is an integral part of this process, the effort and expense associated with developing a plan is lost. To neglect the implementation process is a three-fold loss: the loss of the capital expenditures used in developing a plan; the opportunity cost of the capital expenditures; and, most importantly, the loss of the benefits which would accrue from an improved transportation system.

There are several administrative controls and implementation tools which can aid in the implementation of a thoroughfare plan. They are generally mandated through Federal and State Legislation. They include: Mutual Adoption of the Thoroughfare Plan, Subdivision Regulations, Zoning Ordinances, Official Maps, Urban Renewal, Capital Improvements Programs, and Development Reviews. Generally, two issues play a major role in the implementation process -- available finances and citizen involvement. Effective use of the controls and tools listed above are indicative of good planning and minimize the effects of limited finances and negative citizen reaction to specific elements of a plan. It is through good planning that maximum use is made of every available dollar and that citizen involvement and approval of the transportation plan is obtained.

Mutual Adoption of the Thoroughfare Plan

Chapter 136, Article 3A, Section 136-66.2 of the General Statutes of North Carolina provides that after development of a thoroughfare plan, the plan may be adopted by the governing body of the municipality and the Department of Transportation to serve as the basis for future street and highway improvements. The General Statutes also require that the governing body of the municipality and Department of Transportation shall reach agreement on responsibilities for existing and proposed streets and highways included in the plan. Facilities that are a State responsibility will be constructed and maintained by the Division of Highways. Facilities that are a municipal responsibility will be constructed and maintained by the municipality.

After mutual plan adoption, the Department of Transportation will initiate negotiations to determine responsibility for the existing and proposed thoroughfares. Chapter 136, Article 3A, Section 136-66.1 of the General Statutes provides guidance in the delineation of responsibilities. In summary, these statutes state that the Department of Transportation shall be responsible for those facilities that serve through-traffic and traffic from outside the area to the major business, industrial, governmental, and institutional destinations located inside the municipality. The municipality is responsible for those facilities which serve primarily internal travel.

Subdivision Regulations

Subdivision regulations are locally adopted laws governing the process of converting raw land into building sites. From the planner's view, subdivision regulations are important at two distinct levels. First, they enable the planner to coordinate the otherwise unrelated plans of many individual developers. This process assures that provisions are made for land development elements such as roadway right-of-way, parks, school sites, water lines and sewer outfalls, and so forth. Second, they enable the planner to control the internal design of each new subdivision so that its pattern of streets, lots, and other facilities will be safe, pleasant, and economical to maintain.

To be most effective, subdivision regulations and their administration must be closely coordinated with other local governmental policies and ordinances. Among the more important of these are the Comprehensive Growth Plan, the Utilities Extension Master Plan, and the Thoroughfare Plan.

In practice, subdivision regulations can provide some very positive benefits, such as requiring portions of major streets to be constructed in accordance with the Thoroughfare Plan or requiring subdividers to dedicate and/or reserve rights-of-way in advance of construction. These practices reduce the overall cost of the plan by having some costs borne by developers. Projects in Winterville that could be implemented or protected by subdivision ordinances include:

- construction of the Winterville Bypass
- extension of Fire Tower Road (SR 1708) to Davenport Farm Road (SR 1128)
- extension of Main Street (SR 1133) to Cooper Street (SR 1711)
- extension of Carroll Street (SR 1713) between Mill Street (SR 1149) and NC 11
- construction of new sections along the Eastern Loop, including portions of Reedy Branch Road (SR 1131), Jack Jones Road (SR 1715), and County Home Road (SR 1725)

A list of recommended subdivision ordinances as they pertain to roads is included in Appendix D.

Zoning Ordinances

Zoning is probably the single most commonly used legal device available for implementing a community's land-use plan. To paraphrase the U.S. Department of Commerce 1924 Standard Zoning Enabling Act, on which most present-day legislation is based, zoning can be defined as the division of a municipality (or other governmental unit) into districts, and the regulation within these districts of:

1. the height and bulk of buildings and other structures;
2. the area of a lot which may be occupied and the size of required open spaces;
3. the density of population; and
4. the use of buildings and land for trade, industry, residence, or other purposes.

The characteristic feature of the zoning ordinance that distinguishes it from most other regulations is that it differs from district to district, rather than being uniform throughout a city. Thus, a given area might be restricted to single-family residential development with minimum lot size requirements and setback provisions appropriate for development. In other areas, commercial or industrial development might be permitted, and regulations would be enacted to control such development. Building code provisions or sanitary regulations, on the other hand, normally apply to all buildings in a certain category regardless of where they may be situated within a city.

The zoning ordinance does not regulate the design of streets, utility installation, the reservation or dedication of parks, street rights-of-way, school sites, and related matters. These are controlled by subdivision regulations or possibly by use of an official map. The zoning ordinance should, however, be carefully coordinated with these and other control devices.

Future Street Lines

The Future Street Line Ordinance is of particular benefit where the widening of a street will be necessary at some time in the future. A municipality, with legislative approval, may amend its charter to be empowered to adopt future street line ordinances. Through a metes-and-bounds description of a street's future right-of-way requirements, the Town may prohibit new construction or reconstruction of structures within the future right-of-way. This approach requires the specific design of the facility. It also usually requires surveys and public hearings to allow affected property owners to know what to expect and to make necessary adjustments without undue hardship. A specific ordinance can be enacted for several streets.

Recommended thoroughfare projects where this tool may be applicable include:

- widening of Tar Road (SR 1700)
- widening of Mill Street (SR 1149)
- widening of Fire Tower Road (SR 1708)
- widening of Main Street (SR 1133)
- widening of NC 903

Recommended right-of-way and street cross sections for these thoroughfares are given in Appendix B.

Official Maps

North Carolina General Statutes 136-44.50 through 133-44.53 are collectively designated as the Roadway Corridor Official Map Act. The adoption of a Roadway Corridor Official Map, or Official Street Map as it is more commonly known, places severe but temporary restrictions on private property rights within a specified corridor. These restrictions are in the form of a prohibition for a period of up to three years on the issuance of building permits and the approval of subdivision of property lying within the Official Street Map corridor. This authority should be used carefully and only in cases where less restrictive powers will be ineffective.

The statute establishing the Official Street Map authority is fairly explicit in outlining the procedures to be followed and the types of projects to be considered. As required by the Statute, a project being considered for an Official Street Map must be on an adopted street system plan.

The Program and Policy Branch of the North Carolina Department of Transportation is responsible for aiding in the adoption of Official Street Maps. Cities considering Official Street Map projects should contact this Branch for their "Guidelines for Municipalities Considering Adoption of Roadway Corridor Maps" at:

Program Development Branch
NCDOT
P. O. Box 25201
Raleigh, North Carolina 27611

Urban Renewal

Urban renewal plays a minor role in the transportation planning implementation process in terms of scope and general influence. However, under the right circumstances, renewal programs can make significant contributions. Provisions of the New Housing Act of 1974 (as amended) call for the conservation of good areas, rehabilitation of declining areas, and clearance of slum areas. In the course of renewal, it is important to coordinate with the Thoroughfare Plan to see if additional setbacks or dedication of rights-of-way are needed.

Continued use of urban renewal programs to improve the transportation system is encouraged. Changes that can be made under this program are generally not controversial or disruptive compared to the clearance of a significant area.

Capital Improvements Programs

A Capital Improvements Program, with respect to transportation, is a long-range plan for the spending of money on street improvements, acquisition of rights-of-way and other improvements within the bounds of projected revenues. Municipal funds should be available for construction of street improvements that are a municipal responsibility, right-of-way cost sharing on facilities designated a Division of Highways responsibility, and advance purchase of right-of-way where such action is warranted.

Historically, cities and towns have depended a great deal on Federal or State funding to solve their transportation problems. Chapter 136, Article 3A, of the Road and Highway Laws of North Carolina clearly outlines the responsibilities and obligations of the various governmental bodies regarding highway improvements. North Carolina Highway Bill 1211, passed in 1988, limits the role of municipalities to specific limits in right-of-way cost sharing. Set-back regulations, right-of-way dedications and reservations play a major role in the ultimate cost of many facilities. Only in special cases will the municipality be able to enjoy the benefits of highway improvement without some form of investment.

Development Reviews

Driveway access to a State-maintained street or highway is reviewed by the District Engineer's office and by the Traffic Engineering Branch of the North Carolina Department of Transportation prior to access being allowed. Any development expected to generate large volumes of traffic (e.g., shopping centers, fast food restaurants, or large industries) may be comprehensively studied by staff from the Traffic Engineering, Planning and Environmental, and/or Roadway Design Branches of NCDOT. If done at an early stage, it is often possible to significantly improve the development's accessibility at minimal expense. Since the municipality is the first point of contact for developers, it is important that the municipality advise them of this review requirement and cooperate in the review process.

Other Funding Sources

- (1) Assess user impact fees to fund transportation projects. These fees, called "facility fees" in the legislation, are to be based upon "reasonable and uniform considerations of capital costs to be incurred by the town as a result of new construction. The facility fee must bear a direct relationship to additional or expanded public capital costs of the community service facilities to be rendered for the inhabitants, occupants of the new construction, or those associated with the development process."
- (2) Enact a bond issue to fund street improvements.

- (3) Continue to work with NCDOT to have local projects included in the Transportation Improvement Program (TIP).
- (4) Consider the possibility of specific projects qualifying for federal demonstration project funds.
- (5) Adopt a collector street plan that would assess buyers or property owners for street improvements.
- (6) Charge a special assessment for utilities. For example, increase water and sewer bills to cover the cost of street improvements.
- (7) Lobby for the use of Small Urban and Discretionary Funds, which are funds that the Board of Transportation Member may use at his or her discretion for area road projects.
- (8) Request Industrial Access Funds, which are state funds to construct access roads to large industries.
- (9) Use the municipality's Powell Bill Funds, which can be used for a wide variety of local projects, including roadway construction, maintenance, traffic control, right-of-way acquisition, and bikeways.
- (10) Request federal assistance through the U. S. Department of Housing and Urban Development, including Community Revitalization Block Grants (which can be used to construct local streets), and Economic Development Grants.
- (11) Apply for grants and loans for public works and development facilities from other Federal agencies, e.g., Small Business Development, etc.

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APPENDIX A

Typical Thoroughfare Cross Sections

Typical thoroughfare cross sections are shown in Figure A-1.

Cross section "A" is typical for controlled access freeways. The 46 foot grassed median is the minimum median width. Wider variations could result depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 250 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas that may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes, but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "I".

Cross sections "J" and "K" are recommended for minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more concentrated development.

Cross section "L" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares, projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time.

The curb and gutter cross sections all illustrate the sidewalk next to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk farther away from the street to provide added separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

Rights-of-way shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

If there is sufficient bicycle traffic along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to allow for the bicycle facilities. The North Carolina Bicycle Facility and Program Handbook should be consulted for bicycle facility design standards.

Recommended typical cross sections for thoroughfares were derived using projected traffic, existing capacities, desirable levels of service, and available right-of-way.

TYPICAL THOROUGHFARE CROSS SECTIONS

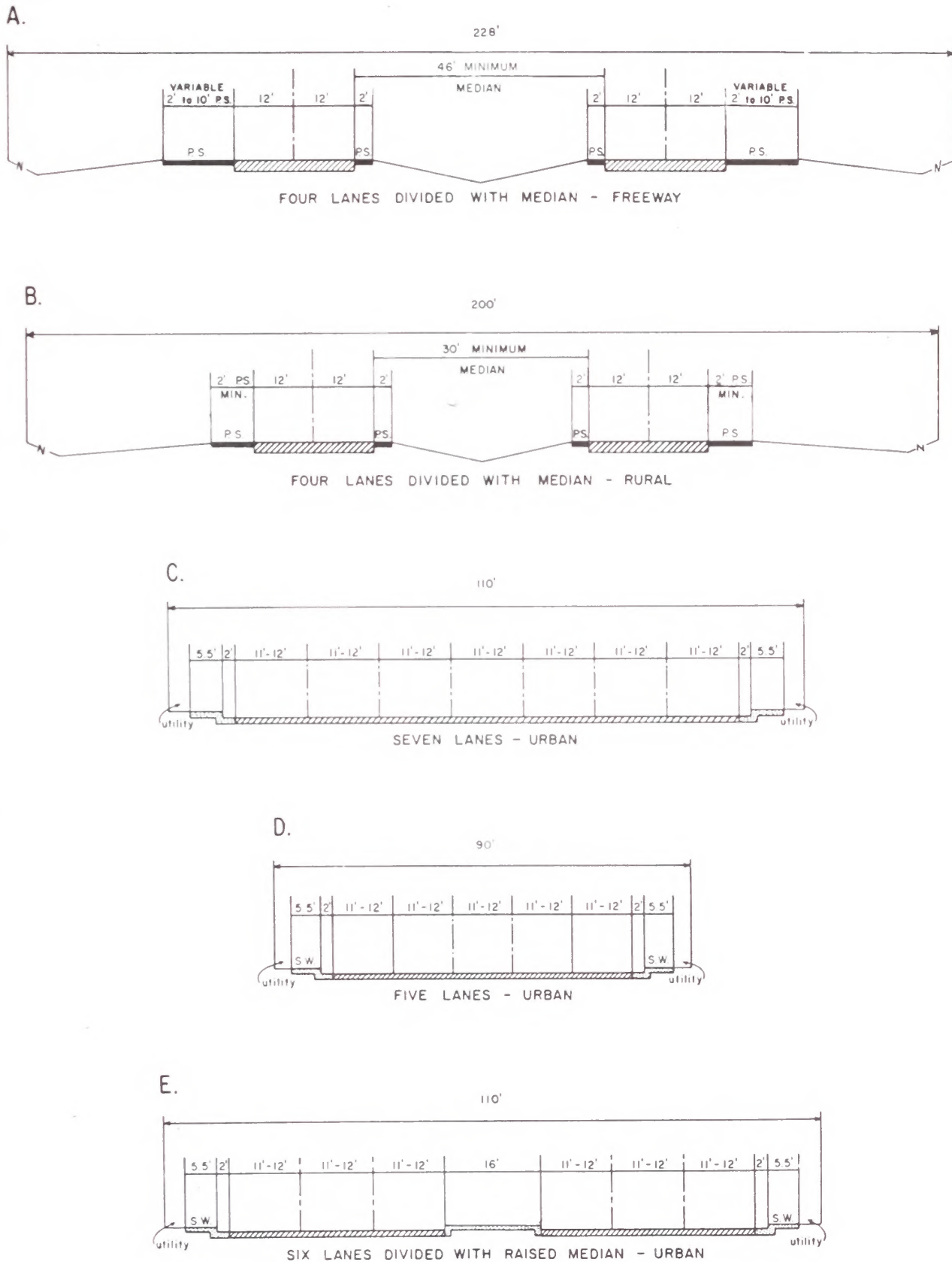
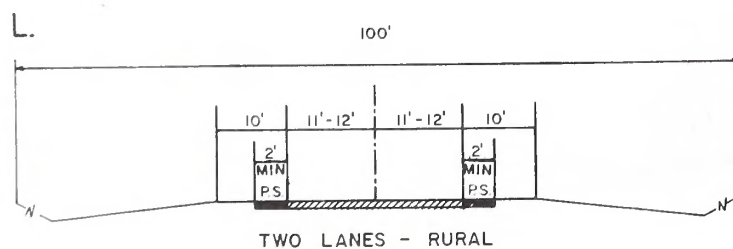
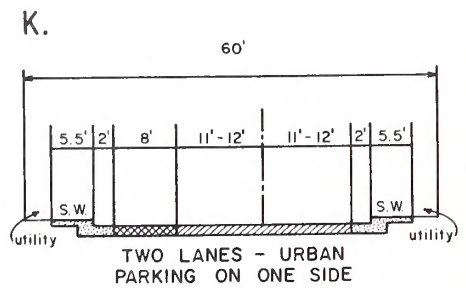
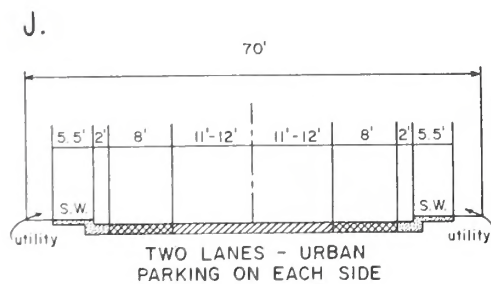
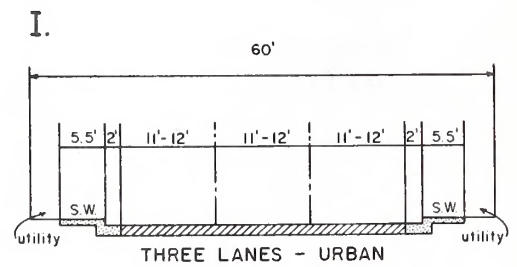
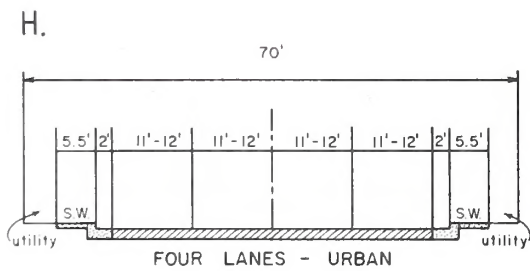
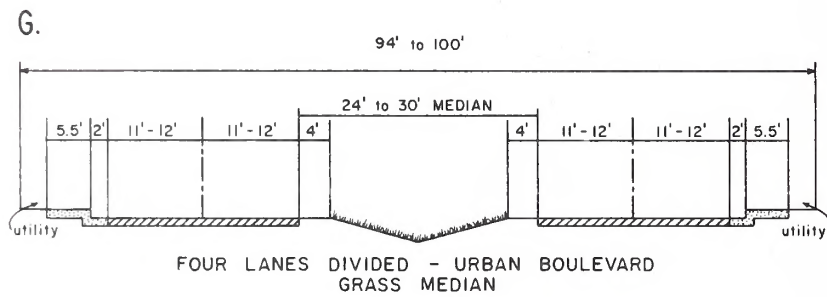
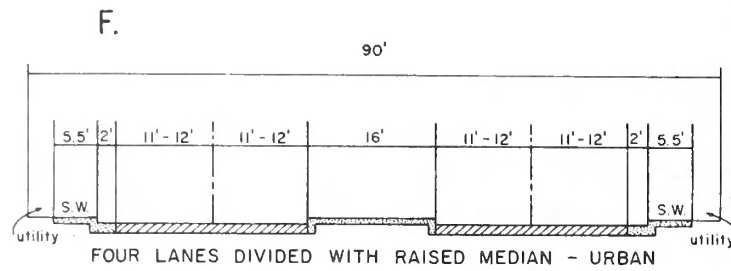


FIGURE A-1

TYPICAL THOROUGHFARE CROSS SECTIONS (CONTINUED)



APPENDIX B

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APPENDIX B

Street Inventory and Recommendations

The Street Inventory and Recommendations consist of a listing of streets in the Winterville Urban Area, base year and future year traffic volumes, and a recommended cross section for each street.

Key:

2L, 3L, 4L, 5L - 2, 3, 4, or 5 lane undivided roadway
2LP - 2 lane road with parking on one or both sides
4LD, 6LD - 4 or 6 lane divided roadway
A through L - Refers to thoroughfare cross sections, Figure A-1
ADQ - Adequate
ADT - Average Daily Traffic
CODE - Refers to thoroughfare cross section diagram
DIST - Distance along section of roadway
MI - Miles
N/A - Not available
PRACTICAL CAPACITY - Capacity at Level of Service D
RDWY - Roadway
ROW - Right-of-way
SR - Secondary Road
UN - Unpaved road
VPD - Vehicles per day

TABLE B-1

Winterville Street Inventory and
Recommendations

ROADWAY REFERENCE SECTION

TABLE B-1 Winterville Street Inventory and Recommendations									
ROADWAY REFERENCE SECTION	EXISTING SYSTEM					RECOMMENDED PLAN			
	CROSS SECTION			PRACTICAL CAPACITY (VPD)	AVERAGE DAILY TRAFFIC		CROSS SECTION		
	DIST (MI)	RDWY (FT/LANES)	ROW (FT)	1990 (VPD)	2005 (VPD)	2015 (VPD)	RDWY (CODE/LANES)	ROW (FT)	ADT 2015 (VPD)
NC 11									
SR 1708 - SR 1149	0.40	48 / 4LD	240	30,000	31,500	43,000	ADQ	ADQ	28,000
SR 1149 - NC 903	1.00	48 / 4LD	240	30,000	21,500	29,000	ADQ	ADQ	15,000
NC 903 - Swift Creek	2.20	48 / 4LD	240	30,000	17,000	22,000	ADQ	ADQ	10,000
Swift Creek - NC 102	2.00	48 / 4LD	240	30,000	10,000	14,000	ADQ	ADQ	12,000
Winterville Bypass									
SR 1128 - NC 903	*	* * *	*	proposed	*	*	A / 4LD	240	48,000 16,000
NC 903 - NC 11	*	* * *	*	proposed	*	*	A / 4LD	240	48,000 12,000
NC 903									
SR 1127 - SR 1131	1.60	20 / 2L	60	9,000	4,700	5,700	L / 2L	ADQ	8,500
SR 1131 - NC 11	0.50	20 / 2L	60	9,000	3,200	3,900	L / 2L	ADQ	6,500
Eastern Loop									
SR 1131, Reedy Branch Rd									
NC 11 - SR 1131	*	* * *	*	proposed	*	*	L / 2L	100	11,000 ---
SR 1131 - SR 1149	0.20	20 / 2L	60	9,000	---	---	L / 2L	ADQ	11,000 ---
SR 1149 - SR 1700	2.03	18 / 2L	60	8,000	700	1,000	L / 2L	ADQ	11,000 2,000
SR 1715, Jack Jones Rd									
Realign SR 1715 with SR 1131	*	* * *	*	proposed	*	*	L / 2L	100	11,000 ---
Realignm't - .2 mi W of SR 1725	1.60	20 / 2L	60	9,000	---	---	L / 2L	ADQ	11,000 3,000
Realign intersection at SR 1725	*	* * *	*	proposed	*	*	L / 2L	100	11,000 ---
SR 1725, County Home Rd									
SR 1715 - SR 1711	1.10	20 / 2L	N/A	9,000	3,700	5,300	L / 2L	60	11,000 6,000
SR 1711 - SR 1708	2.10	24 / 2L	80	11,000	4,700	6,200	ADQ	ADQ	7,000
SR 1120, Jolly Rd									
NC 903 - NC 102	3.50	18 / 2L	N/A	8,000	1,500	2,000	L / 2L	60	11,000 2,000
SR 1125, Pocosin Rd									
SR 1127 - NC 903	0.80	18 / 2L	N/A	8,000	1,200	1,500	L / 2L	60	11,000 1,500

TABLE B-1

Winterville Street Inventory and
Recommendations

ROADWAY REFERENCE SECTION	EXISTING SYSTEM			RECOMMENDED PLAN				
	CROSS SECTION		PRACTICAL CAPACITY (VPD)	AVERAGE DAILY TRAFFIC		CROSS SECTION		
	DIST (MI)	RDWY (FT/LANES)	ROW (FT)	1990 (VPD)	2005 (VPD)	2015 (VPD)	RDWY (CODE/LANES)	ROW CAPACITY (FT) (VPD)
SR 1126, G. A. Forlines Rd	1.60	16 / 2L	N/A	N/A	---	---	L / 2L	60 11,000

SR 1127, Frog Level Rd	2.30	18 / 2L	N/A	900	1,400	1,900	L / 2L	60 11,000
								1,900
SR 1128, Davenport Farm Rd	1.00	20 / 2L	N/A	950	2,000	3,000	I / 3L	70 16,000
								6,000
SR 1708, Fire Tower Rd	*	* * *	* * *	proposed	* * *	* * *	I / 3L	70 16,000
	1.20	22 / 2L	60	N/A	10,800	14,500	D / 5L	100 25,000
SR 1129	0.43	24 / 2L	N/A	N/A	---	---	ADQ	ADQ

SR 1131, Vernon White Rd	0.18	22 / 2L	N/A	800	1,200	1,400	ADQ	ADQ
								1,400
SR 1130, Vernon White Rd	0.19	22 / 2L	N/A	N/A	---	---	ADQ	ADQ

SR 1131, Reedy Branch Rd	0.40	40 / 2LP	N/A	N/A	---	---	ADQ	ADQ

SR 1147 - SR 1128	0.50	20 / 2L	N/A	9,000	2,900	3,900	L / 2L	60 11,000
								3,900
SR 1128 - NC 903	1.20	20 / 2L	60	9,000	3,200	4,500	L / 2L	ADQ 11,000
								4,500
NC 903 - NC 11	0.60	22 / 2L	N/A	10,000	2,500	3,500	ADQ	ADQ
								3,500
NC 11 - proposed Eastern Loop	1.20	22 / 2L	N/A	10,000	2,200	2,900	ADQ	ADQ
								2,900
see: Eastern Loop	1.20	20 / 2L	60	9,000	---	---	L / 2L	ADQ 11,000

	0.80	20 / 2L	60	9,000	---	---	L / 2L	ADQ 11,000

TABLE B-1

Winterville Street Inventory and
Recommendations

ROADWAY REFERENCE SECTION

ROADWAY REFERENCE SECTION	EXISTING SYSTEM					RECOMMENDED PLAN				
	CROSS SECTION		PRACTICAL CAPACITY		AVERAGE DAILY TRAFFIC		CROSS SECTION			ADT 2015 (VPD)
	DIST (MI)	RDWY (FT/LANES)	ROW (FT)	VPD	1990 (VPD)	2005 (VPD)	2015 (VPD)	RDWY (CODE/LANES)	ROW (FT)	CAPACITY (VPD)
SR 1133, Main Street										
NC 11 - WCL Winterville	0.10	20 / 2L	N/A	9,000	2,750	4,000	5,100	I / 2L	60	15,000
WCL Winterville - SR 1149	0.26	36 / 2LP	N/A	10,000	2,200	3,500	4,700	*I / 3L	ADQ	15,000
SR 1149 - East St	0.47	36 / 2LP	N/A	10,000	3,250	5,000	6,800	*I / 3L	ADQ	15,000
East St - SR 1700	0.55	18 / 2L	N/A	8,000	1,800	2,800	3,700	I / 2L	60	15,000
SR 1700 - SR 1711	*	* * *	* * *	proposed	*	*	*	L / 2L	60	11,000
										4,000
SR 1149, Mill St										
NC 11 - NCL Winterville	0.52	20 / 2L	100	9,000	6,700	10,500	14,000	D / 5L	ADQ	25,000
NCL Winterville - Tyson St	0.30	20 / 2L	100	9,000	N/A	---	---	D / 5L	ADQ	25,000
Tyson St - Main St	0.39	44 / 2L	100	12,000	5,800	8,600	11,000	D / 5L	ADQ	25,000
Main (1133) - Cooper St (1711)	0.06	44 / 2L	100	12,000	7,500	11,000	14,000	D / 5L	ADQ	25,000
Cooper St - Blount St	0.09	44 / 2L	100	12,000	5,750	8,300	11,000	D / 5L	ADQ	25,000
Blount St - SR 1131	1.25	20 / 2L	100	9,000	3,850	5,600	7,200	D / 5L	ADQ	25,000
SR 1700, Tar Rd										
SR 1708 - SR 1130	1.10	20 / 2L	N/A	9,000	5,950	10,700	15,900	D / 5L	100	25,000
SR 1130 - SR 1133	0.60	20 / 2L	N/A	9,000	5,650	10,200	15,000	D / 5L	100	25,000
SR 1133 - SR 1711	0.20	20 / 2L	N/A	9,000	3,400	7,000	11,500	D / 5L	100	25,000
SR 1711 - SR 1131	1.50	20 / 2L	N/A	9,000	2,600	5,400	8,800	D / 5L	100	25,000
SR 1708, Fire Tower Rd										
see: SR 1128, Davenport Farm Rd										
SR 1709, Corey Rd										
SR 1708 - SR 1711	2.20	20 / 2L	60	9,000	N/A	---	---	ADQ	ADQ	ADQ
SR 1711, Cooper St										
SR 1149 - Ange St	0.41	39 / 2L	N/A	12,000	4,150	6,000	7,700	ADQ	ADQ	ADQ
Ange St - SR 1700	0.67	22 / 2L	N/A	10,000	3,000	4,600	6,000	ADQ	ADQ	ADQ
SR 1700 - SR 1725	2.10	18 / 2L	N/A	8,000	3,300	4,800	6,100	L / 2L	60	11,000

* = No construction necessary

TABLE B-1

Winterville Street Inventory and
Recommendations

ROADWAY REFERENCE SECTION	EXISTING SYSTEM			RECOMMENDED PLAN				
	CROSS SECTION		PRACTICAL CAPACITY (VPD)	AVERAGE DAILY TRAFFIC		CROSS SECTION		
	DIST (MI)	RDWY (FT/LANES)	ROW (FT)	1990 (VPD)	2005 (VPD)	2015 (VPD)	RDWY (CODE/LANES)	ROW CAPACITY (FT) (VPD)

SR 1712, Ange St

SR 1713 - Sylvia St
Sylvia St - Blount St
Blount St - SR 1711

0.37 20 / 2L 60 --- --- --- ADQ ADQ ---
0.10 20 / 2L N/A --- --- --- ADQ ADQ ---
0.10 30 / 2L N/A --- --- --- ADQ ADQ ---

SR 1713, Carroll St

NC 11 - SR 1149

SR 1149 - SR 1714

SR 1714 - SR 1700

SR 1700 - SR 1715

* * * * * proposed * * * * * L / 2L
0.12 20 / 2L 60 1,000 1,400 ADQ ADQ 11,000 2,500
1.14 20 / 2L 60 9,000 --- ADQ ADQ 2,000
1.40 20 / 2L 70 9,000 --- ADQ ADQ ---

SR 1714, Church St

Main St - SR 1711, Cooper St

Cooper St - Linden Ln

Linden Ln - SR 1713, Carroll St

Carroll St - Winterville CL

CL - SR 1131, Reedy Branch Rd

0.10 34 / 2L N/A 12,000 2,000 2,500 ADQ ADQ 2,500
0.41 44 / 2L N/A 12,000 --- ADQ ADQ ---
0.10 20 / 2L N/A 9,000 --- ADQ ADQ ---
0.13 22 / 2L N/A 10,000 --- ADQ ADQ ---
0.80 22 / UN N/A 2,000 --- PAVE 60 10,000 ---

SR 1715, Jack Jones Rd

see: Eastern Loop

SR 1718, Park Rd

SR 1149 - SR 1714

0.20 18 / UN N/A 2,000 --- --- PAVE 60 10,000 ---

SR 1725, County Home Rd

see: Eastern Loop

SR 2106, Red Forbes Rd

SR 1126 - NC 903

0.90 20 / 2L 60 9,000 175 300 500 ADQ ADQ 500

A solid black rectangular block, likely a redacted area or a placeholder for an image. It is positioned in the upper right quadrant of the page.

GREENVILLE

THOROUGHFARE PLAN

MAY 10, 1990



ADOPTED BY CITY OF GREENVILLE
MAY 10, 1990
RECOMMENDED APPROVED BY PLANNING
AND RESEARCH BOARD, JULY 13, 1990
ADOPTED BY NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION, JUNE 1, 1990

PUBLIC MEETINGS
5-15-89, 5-16-89, 5-17-89
5-18-89, 5-19-89, 5-20-89
5-21-89, 5-22-89, 5-23-89
5-24-89, 5-25-89, 5-26-89

PUBLIC HEARINGS
5-15-89, 5-16-89, 5-17-89
5-18-89, 5-19-89, 5-20-89
5-21-89, 5-22-89, 5-23-89
5-24-89, 5-25-89, 5-26-89

LEGEND

EXISTING
MAJOR THOROUGHFARES
FREEWAYS
OTHER
MINOR THOROUGHFARES
INTERCHANGE
GRADE SEPARATION

PROPOSED
MAJOR THOROUGHFARES
FREEWAYS
OTHER
MINOR THOROUGHFARES
INTERCHANGE
GRADE SEPARATION





FIGURE C-2

ADOPTED BY:
TOWN OF AYDEN, MAY 11, 1992

RECOMMENDED FOR APPROVAL BY: *m. r. f. d. b.*
STATEWIDE PLANNING BRANCH MAY 18, 1992

ADOPTED BY:
DEPT. OF TRANSPORTATION, JULY 10, 1992

PUBLIC HEARING: MAY 11, 1992

LEGEND

	EXISTING	PROPOSED
MAJOR THOROUGHFARE		
MINOR THOROUGHFARE		
INTERCHANGES		

THOROUGHFARE PLAN AYDEN

PITT COUNTY
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-PLANNING AND ENVIRONMENTAL BRANCH

IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE: 1" = 1000'

MAY 11, 1992

AM I LINDA D

APPENDIX D

Recommended Subdivision Ordinances Controlling Roadway Design Definitions

Streets and Roads:

A. Rural Roads

1. **Principal Arterial** - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.
2. **Minor Arterial** - A rural roadway joining cities and larger towns and providing intrastate and inter-county service at relatively high overall travel speeds with minimum interference to through movement.
3. **Major Collector** - A road which serves major intra-county travel corridors and traffic generators and provides access to the Arterial system.
4. **Minor Collector** - A road which provides service to small local communities and traffic generators and provides access to the Major Collector system.
5. **Local Road** - A road which serves primarily to provide access to adjacent land, over relatively short distances.

B. Urban Streets

1. **Major Thoroughfares** - Major thoroughfares consist of Interstate and other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.
2. **Minor Thoroughfares** - Minor thoroughfares collect traffic from local access streets and carry it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through-traffic movements and may also serve abutting property.
3. **Local Street** - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

C. Specific Types of Rural or Urban Streets

1. **Freeway, expressway, or parkway** - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A freeway provides for continuous flow of vehicles to selected crossroads only by way of interchanges. An expressway is a facility with full or partial control of access and generally with grade separations at major intersections. A parkway is for non-commercial traffic, with full or partial control of access.
2. **Residential Collector Street** - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.
3. **Local Residential Street** - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.
4. **Cul-de-sac** - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.
5. **Frontage Road** - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.
6. **Alley** - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

- A. **Building Setback Line** - A line parallel to the street in front of which no structure shall be erected.
- B. **Easement** - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.
- C. **Lot** - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

III. Subdivision

- A. **Subdivider** - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.
- B. **Subdivision** - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations:
(1) the combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than ten acres where no street right-of-way dedication is involved; (3) widening of open streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right of way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.
- C. **Dedication** - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.
- D. **Reservation** - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

DESIGN STANDARDS

I. Streets and Roads

The design of all roads within the Town of Winterville shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted by the Town of Winterville and the North Carolina Department of Transportation.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

The urban planning area shall consist of that area within the urban planning boundary as depicted on the mutually adopted Brevard Thoroughfare Plan. The rural planning area shall be that area outside the urban planning boundary.

- A. **Right-of-way Widths** - Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the Thoroughfare Plan.

1. Rural	Minimum ROW
a. Principle Arterial	
Freeways	350 ft.
Other	200 ft.
b. Minor Arterial	100 ft.
c. Major Collector	100 ft.
d. Minor Collector	80 ft.
e. Local Road	* 60 ft.
2. Urban	
a. Major Thoroughfare other than Freeway and Expressway	90 ft.
b. Minor Thoroughfare	70 ft.
c. Local Street	* 60 ft.
d. Cul-de-sac	** Variable

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. On all cases in which right-of-way is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from

* The desirable minimum right-of-way (ROW) is 60 ft. If curb and gutter is provided, 50 feet of ROW is adequate on local residential streets.

** The ROW dimension will depend on radius used for vehicular turn-around. Distance from edge of pavement of turn-around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn-around.

internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width right-of-way, not less than sixty feet in width may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

B. **Street Widths** - Width for street and road classifications other than local shall be as required by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

1. Local Residential -

Curb and Gutter section: 26 feet, face to face of curb
Shoulder section: 20 feet to edge of pavement, 4 foot
 shoulders

2. Residential Collector -

Curb and Gutter section: 34 feet, face to face of curb
Shoulder section: 20 feet to edge of pavement, 6 foot
 shoulders

C. **Geometric Characteristics** - The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

1. **Design Speed** - The design speed for a roadway should be a minimum of 5 mph greater than the posted speed limit. The design speeds for subdivision type streets shall be:

TABLE D-1

DESIGN SPEEDS

Facility Type	Desirable Speed	----- Minimum Speed ----- Level Rolling Mountainous		
Rural				
Minor Collector Roads	60	50	40	30
Local roads, including Residential Collectors and Local Residential	50	* 50	* 40	* 30
Urban				
Major Thoroughfares, other than Freeway, Expressway, or Parkway	60	50	50	50
Minor Thoroughfares	60	50	40	40
Local Streets	40	** 40	** 30	** 30

* Based on projected annual average daily traffic of 400-750. In cases where road will serve a limited area and small number of dwelling units, minimum design speeds can be reduced further.

** Based on projected annual average daily traffic of 50-250.

2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

TABLE D-2			
MAXIMUM VERTICAL GRADE			
Design Speed	---- Terrain ----		
	Level	Rolling	Mountainous
60	4	5	6
50	5	6	7
40	6	7	8
30		9	10
20			12

- b. A minimum grade for curbed streets should not be less than 0.5%.
- c. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5 percent.
- d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long may be 50% greater than the value in the above table.

3. **Minimum Sight Distance** - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters: ---

TABLE D-3				
SIGHT DISTANCE				
Design Speed, MPH	30	40	50	60
Stopping Sight Distance:				
Minimum (ft.)	200	275	400	525
Desirable Minimum (ft.)	200	325	475	650
Minimum K* Value for:				
Crest Curve	30	80	160	310
Sag Curve	40	70	110	160
Passing Sight Distance:				
Minimum Passing Distance for 2 lanes, in feet	1,035	1,460	1,915	2,380

(General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case.)

Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1984."

* K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide the desired sight distance.

4. The "Superelevation Table" below shows the maximum degree of curve and related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

TABLE D-4			
SUPERELEVATION TABLE			
Design Speed	Maximum e*	Minimum Radius ft.	Max. Deg. of Curve
30	0.04	302	19 00'
40	0.04	573	10 00'
50	0.04	955	6 00'
60	0.04	1,528	3 45'
30	0.06	273	21 00'
40	0.06	509	11 15'
50	0.06	849	6 45'
60	0.06	1,380	4 15'
30	0.08	252	22 45'
40	0.08	468	12 15'
50	0.08	764	7 30'
60	0.08	1,206	4 45'

* e = rate of roadway superelevation, foot per foot

D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.
2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.
3. Offset intersections are to be avoided. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

E. Cul-de-sacs

Cul-de-sacs shall not be more than seven hundred (700) feet in length. The distance from the edge of pavement on the vehicular turn-around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn-around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provision is made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.
2. The width of an alley shall be at least twenty (20) feet.
3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn-around facilities at the dead-end as may be required by the Planning Board.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

I. Wheelchair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

Wheelchair ramps and depressed curbs shall be constructed in accordance with details contained in the Department of Transportation, Division of Highways, publication entitled, "Guidelines, Curb Cuts and Ramps for Handicapped Persons."

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:
 - a. Shoulder section approach
 - i. Under 800 ADT design year: Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.
 - ii. 800 - 2000 ADT design year: Minimum 34 feet width face to face of parapets of rails or pavement width plus 12 feet, whichever is greater.
 - iii. Over 2000 ADT design year: Minimum width of 40 feet, desirable width of 44 feet width face to face of parapets of rails.
 - b. Curb and gutter approach
 - i. Under 800 ADT design year: Minimum 24 feet face to face of curbs.
 - ii. Over 800 ADT design year: Width of approach pavement measured face to face of curbs.

Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1'6" minimum, or greater if sidewalks are required.

2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:
 - a. Shoulder section approach - Width of approach pavement plus width of usable shoulders on the approach left and right. (Shoulder width 8' minimum, 10' desirable.)
 - b. Curb and gutter approach - Width of approach pavement measured face to face of curbs.

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